# Mining CONGRESS JOURNAL

SEPTEMBER 1948


## Battery-powered haulage units and EXIDE-IRONCLAD® BATTERIES

### Teamed to increase tonnage . . . . . reduce haulage costs

The steady, uninterrupted service of battery-powered haulage units brings increased tonnage . . . cuts haulage costs. That's why so many battery-powered locomotives, trammers and shuttle cars are being used in modern high-production mining operations. You can be sure of full-shift availability when Exide-Ironclad Batteries provide the power!

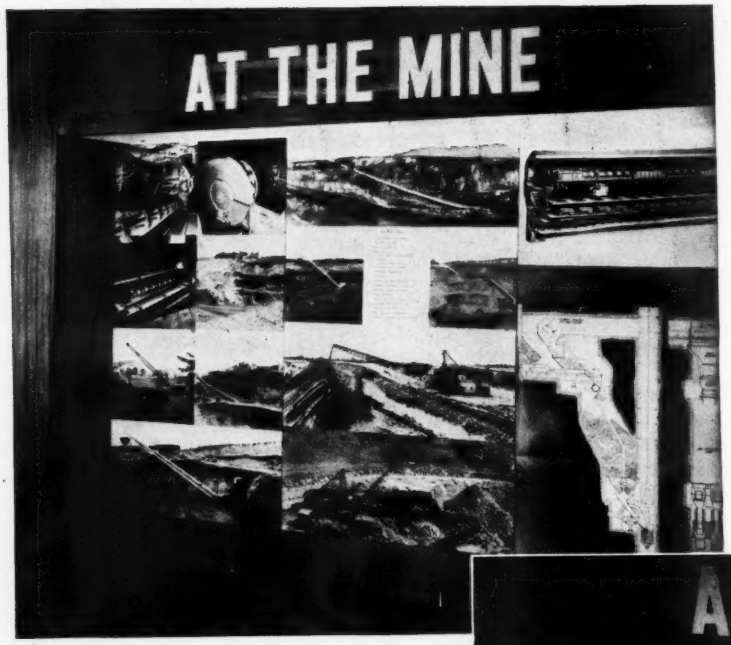
Exide-Ironclad Batteries have *all* four of these vital characteristics of a storage battery, high power ability, high electrical efficiency, ruggedness and long life . . . assuring years of safe, dependable day-in-day-out mine haulage service.

Visit Exide Booth 317
American Mining Congress
Civic Auditorium
San Francisco
September 20, 21, 22 and 23

**1888 . . . Dependable Batteries for 60 years . . . 1948**

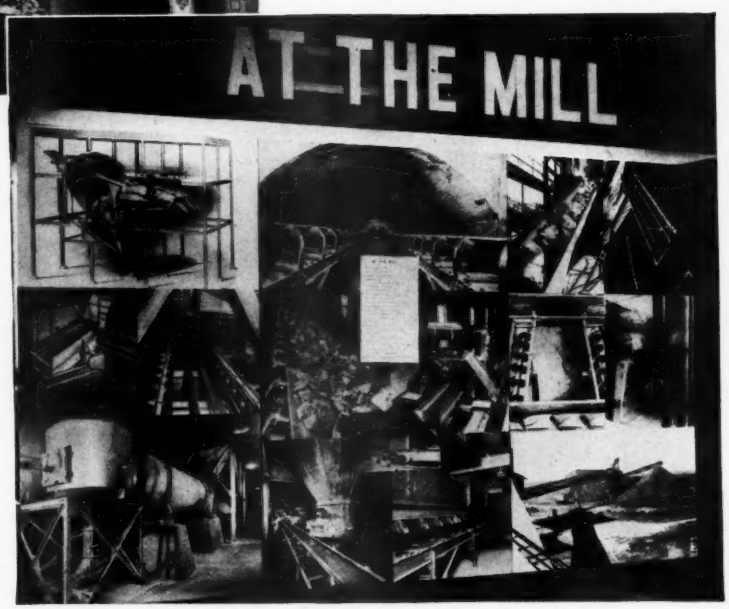
If you have a special battery problem, or wish more detailed information, write . . .
THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32
*Exide Batteries of Canada, Limited, Toronto*

# At the 1948 Metal Mining Show—




## LINK-BELT *Equipment on Parade*

**SAN FRANCISCO—**
**SEPT. 20-23**




Again the Link-Belt exhibit at the Metal Mining Show to be held in the Civic Auditorium, San Francisco, Sept. 20-23, will present new engineering developments in equipment, attesting to American ingenuity in materials handling preparation and power transmission.

The Link-Belt Float-Sink Concentrator is distinctly new—announced recently—for cleaning coal, ores and similar materials by the Heavy-Media method of separating and removing the rejects.

The new Link-Belt Gearmotor will be on display; also the Electrofluid Drive, the P.I.V. Gear variable speed changer, modern belt conveyor idlers, ball and roller bearings and other power transmission units.

Link-Belt specialists will be on hand to be of service to visitors at spaces Nos. 517 and 519. We'll be glad to see you.

**LINK-BELT COMPANY**

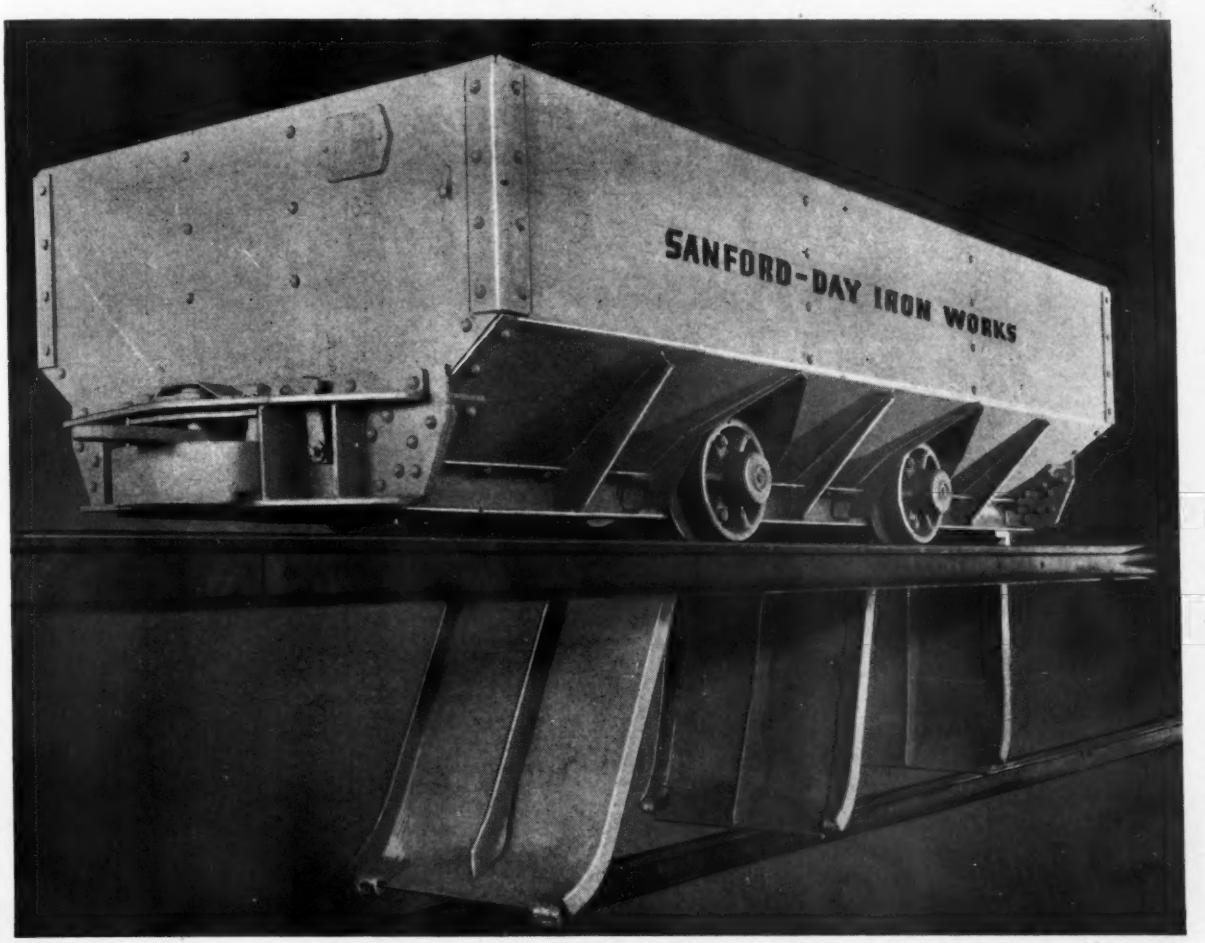
Chicago 9, Philadelphia 40, Pittsburgh 13, Wilkes-Barre, Huntington, W. Va., Atlanta, Dallas 1, Minneapolis 5, Denver 2, Kansas City 6, Mo., Los Angeles 33, San Francisco 24, Cleveland 13, Indianapolis 6, Detroit 4, St. Louis 1, Seattle 4, Vancouver, Toronto 8.

11,245

**LINK-BELT**

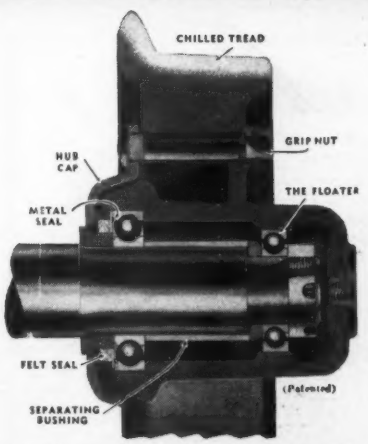
CONVEYORS, MATERIALS HANDLING, PREPARATION AND POWER TRANSMISSION MACHINERY

# Are They *Efficient?...Profitable?...*
# ASK THE MINES THAT USE THEM




**If you're not using S-D "Automatic" cars . . . if you don't know the advantages of these fine cars, then check with some mines who are using them. We'll give you plenty of names. Get the facts and you'll discover that modern S-D "Automatics" are a "must" for most profitable operation. Innumerable coal operators have discovered the truth of this statement.**

**S-D "Automatics" are supplied with tonnage capacities to suit requirements. In the average, they last 15 to 20 years. They have extremely large capacity for equal overall dimensions. They are not wracked by end or rotary dumping. Fifty tons or more of coal can be discharged into the storage bin per minute—automatically and without labor. The coal is laid down gently in the bin, thus reducing greatly the breakage of lumps. S-D "Automatics" are now equipped with an unlatching device that operates from underneath the car. The old sidewise extending latch-lever bar that gave trouble at times is no longer used. If any operator feels that he does not want to buy S-D "Automatics" on a cash basis, we will be very glad to lease them. Today, a large percentage of our "Automatics" are being leased. The operators like to lease them. Write us for full particulars.**

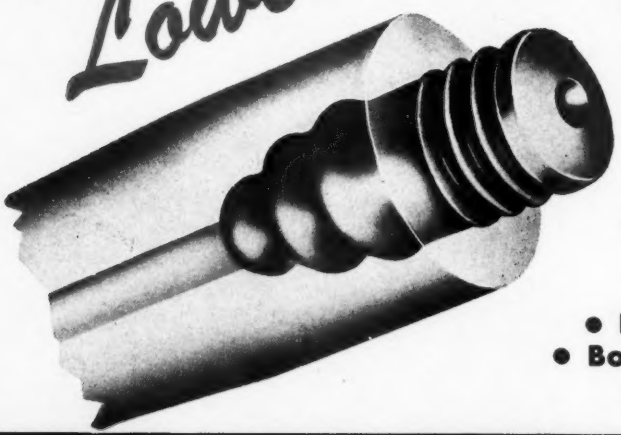



***Don't overlook the advantages of our "Floater" Ball-bearing Wheels***

*20 Car loads of "Automatics" from—*

**SANFORD-DAY IRON WORKS, Inc. • Knoxville, Tenn.**

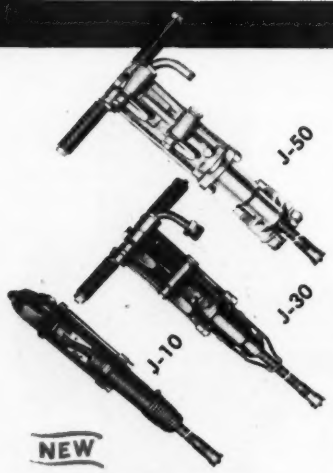
# The Outstanding Contribution to Lower Cost Mining . . .



## CARSET JACKBITS

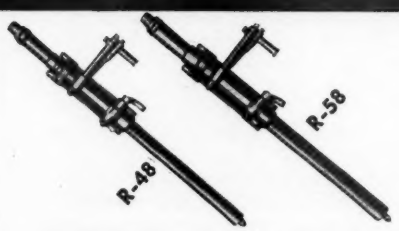
*Manufactured exclusively by Ingersoll-Rand Company*

**• Drill Faster • Wear Longer**
**• Boost Tonnage • Save Powder**
**• Reduce Maintenance**

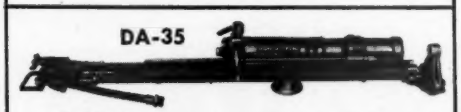



NEW

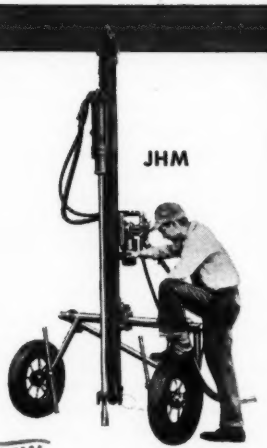
**JACKHAMERS** — Ingersoll-Rand makes a Jackhamer for every need and type of work. The new powerful J-10 Utility Jackhamer that weighs only 14 pounds has many applications in the mining industry. Carset Jackbits permit unheard of production when used with any size I-R Jackhamer.




**STOPEHAMERS** — Ingersoll-Rand Stopehamers are available in two sizes. These balanced machines have established records for durability and high drilling speeds. Here again Carset Jackbits will boost tonnage and considerably reduce bit changes.




**DRIFTERS**—Three famous Ingersoll-Rand Drifters—the DA-30, DA-35, and the D-505 are turning in record performances the world over. Tunnel contractors report less time per round and more time for mucking with Carset Jackbits.




NEW

**WAGONJACK**—A Jackhamer or light drifter mounted on this lightweight wagon mounting will drill twice as many feet of hole per shift as when held by hand. It holds the bit down to the rock. When used with Carset Jackbits and long feeds, production is even greater.

# CARSET COMBINATIONS

## MAXIMUM PRODUCTION AT MINIMUM COST

In ground where steel bits are drilling *two to ten feet per bit usage*, CARSET JACKBITS manufactured exclusively by Ingersoll-Rand are *averaging from two hundred to more than a thousand feet*. The smaller sizes beginning at 1⅜" are setting new production records in tunnel driving and mining. The revolutionary QUARRYMASTER on one prominent installation with 5½ inch CARSET BITS is drilling over one thousand feet of hole per bit. This is in ground that could not be drilled economically with conventional large hole drills.

Combine the sensational features of CARSET JACKBITS with proven Ingersoll-Rand Jackhamers, Drifters and Stopehamers. Use CARSET BITS with long feeds on the new labor-aiding, cost-saving Quarrymaster, Boom Jumbo and Wagonjack.

Carset Combinations are recommended for highest overall efficiency. Increased production and shorter drilling time mean substantial savings in overhead. Consult our experienced drilling engineers—Ingersoll-Rand mining machinery is sold by men who know rock drilling.

*We will see you at the ⊞ Booth at the Metal Mining Show—San Francisco, Sept. 20-23*

NEW

**BOOM JUMBO** — Developed by Ingersoll-Rand engineers with air-powered booms to meet the ever increasing demands of management and labor for greater production with less effort and lower costs. For highest production use it with long feeds and Carset Jackbits.

NEW Ingersoll-Rand QUARRYMASTER

A heavy duty air-powered drill for open pit, stripping and quarry work. With 6" Carset Jackbits, it drills hole after hole with practically no time lost in changing bits or cleaning cuttings from the hole.

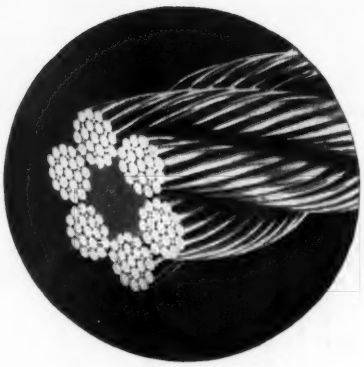
# Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

337-16

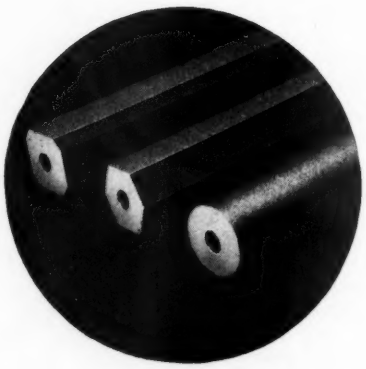
*I-R PRODUCTS FOR THE MINING INDUSTRY*—Mobil-Air Compressors, Stationary Compressors, Paving Breakers, Stud Jackbits, Drill Sharpeners, Drill Steel Furnaces, Jackmills, Jackbit Grinders, Sump Pumps, Slusher Hoists, Airlite Generators, Centrifugal Pumps, Diesel Engines, Blowers.

# The Steel Products You Need for *METAL MINING*



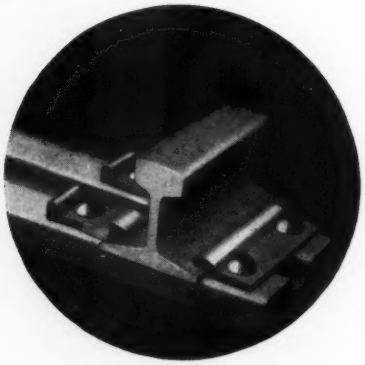
## HOLLOW DRILL STEEL

— Bethlehem Hollow is top-grade drill steel suitable for either forged-on or detachable bits. It is uniform in size, shape and mechanical properties. Its wide quenching-range makes it easy to heat-treat for proper hardness and wear-resistance. Available in rounds, hexagons, and quarter-octagons.



## WIRE ROPE

— Bethlehem manufactures a full line of wire ropes for use on shaft hoists, incline planes, scrapers and other equipment around metal mines. These ropes come in a complete range of diameters, grades, and constructions, including Formset (preformed) and Purple Strand (improved plow steel), the strongest grade of steel used in making wire rope.

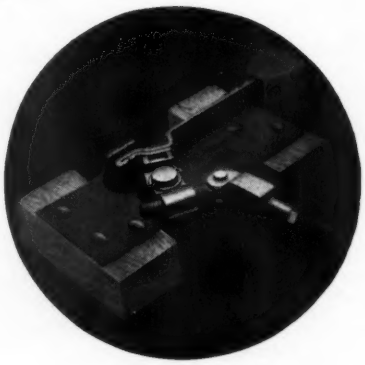


## STEEL MINE TIES

— Bethlehem's No. 2 and No. 3 mine ties are ideal for metal-mine trackage. They are furnished with any one of nine different types of clips to accommodate rails from 12 to 60 lbs. Simple to install, these ties can be taken up and used repeatedly. Rails are held true to gage and tracks are permanently aligned.

## SWITCH STANDS

—Bethlehem parallel-throw switch stands are designed for use with light rails on turnouts or crossovers. Ruggedly built with only three working parts, these simple stands give years of trouble-free service. They are safe, positive-closing and self-cleaning.



**OTHER BETHLEHEM PRODUCTS FOR USE IN MINING**

Mine Cars • Mine Car Wheels • Axles • Pipe
Bolts, Nuts and Spikes • Roofing • Siding

BETHLEHEM PACIFIC COAST STEEL CORPORATION
*Sales Offices:* San Francisco, Los Angeles, Portland, Seattle, Honolulu

BETHLEHEM STEEL

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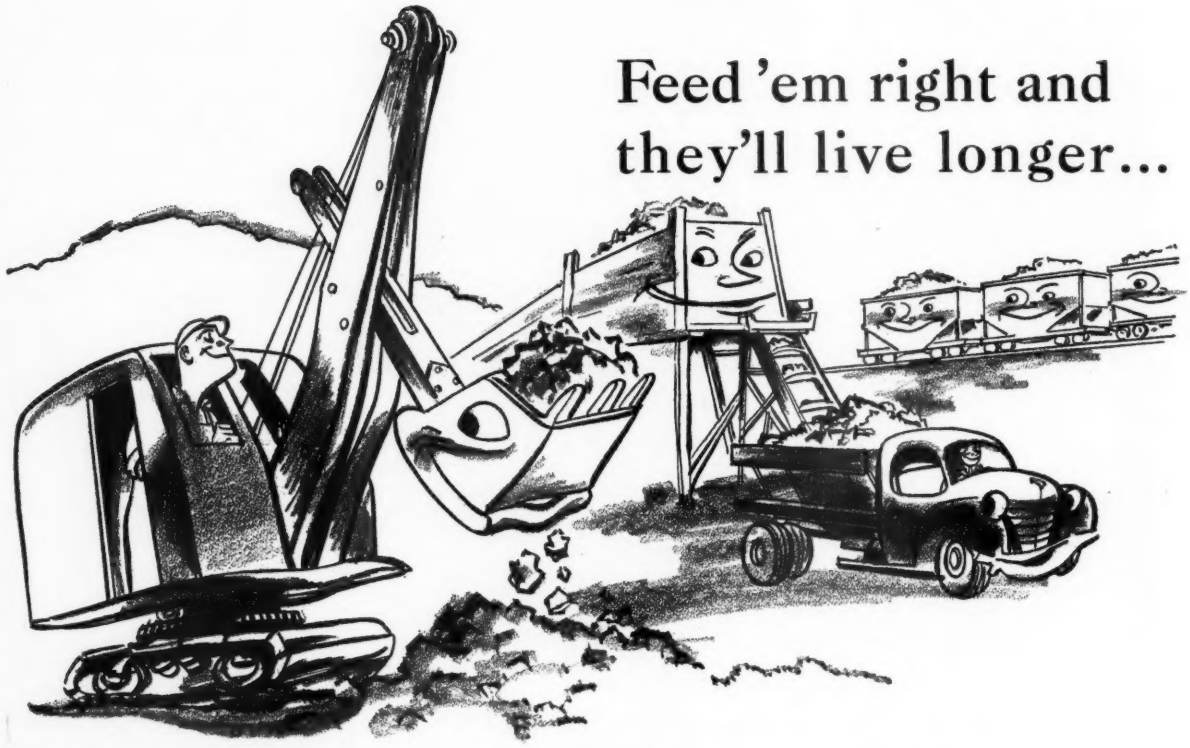


# ROCKMASTER Better Breakage is Better Bucket Food

Breakage, too, is a matter of digestion—for your removal equipment. That's another reason why it pays to use the Rockmaster Blasting System. Rockmaster's better breakage pays off in longer equipment life and speedier handling in quarries, strip pits and mines.

Buckets bite into more evenly broken, smaller rock—and that means less strain on your shovel's powerhouse as well as on the bucket itself. Loaders, mine cars, trucks, all carry heavier loads under lighter strain. Big rocks that require secondary blasting are cut to a minimum. It's full speed ahead after a Rockmaster millisecond delay blast.

Rockmaster is the original millisecond delay blasting system—pioneered by Atlas. No special equipment is needed. For some operators, Rockmaster methods have saved tens of thousands of dollars a year. Your Atlas representative will gladly discuss ways that Rockmaster can be of help to you in your mining, quarrying and construction work. Call him today.

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705-707
*at the*
**Metal Mining Exposition**
•
Civic Auditorium
San Francisco
•
September 20-23

"ROCKMASTER"—Trade Mark

**ATLAS EXPLOSIVES**
*"Everything for Blasting"*

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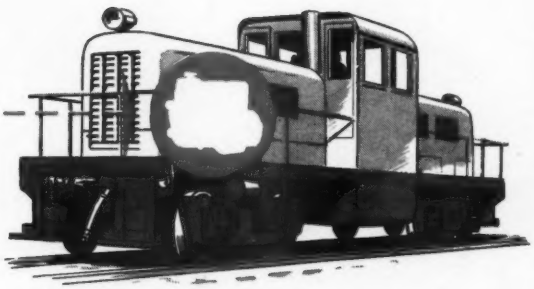
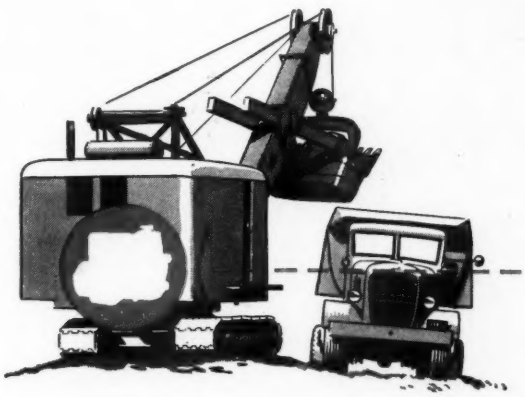
# Watch this space





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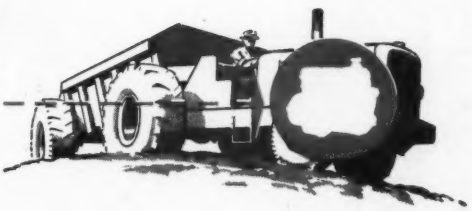
## ...and this space



CUMMINS Dependable DIESEL

SINCE 1918...PIONEER OF PROFITABLE POWER THROUGH HIGH SPEED DIESELS

... for a new Cummins Diesel, built with the rugged simplicity of the famous "Model H" and designed to surpass its 15-year reputation for profit-making performance and economy. This is the *space to watch* next month.

**CUMMINS ENGINE COMPANY, INC. • COLUMBUS, INDIANA**

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958 North Fourth Street, Columbus 16, Ohio

CUTTERS • DRILLS • CONVEYORS • LOADERS • LOCOMOTIVES • JIGS • FANS



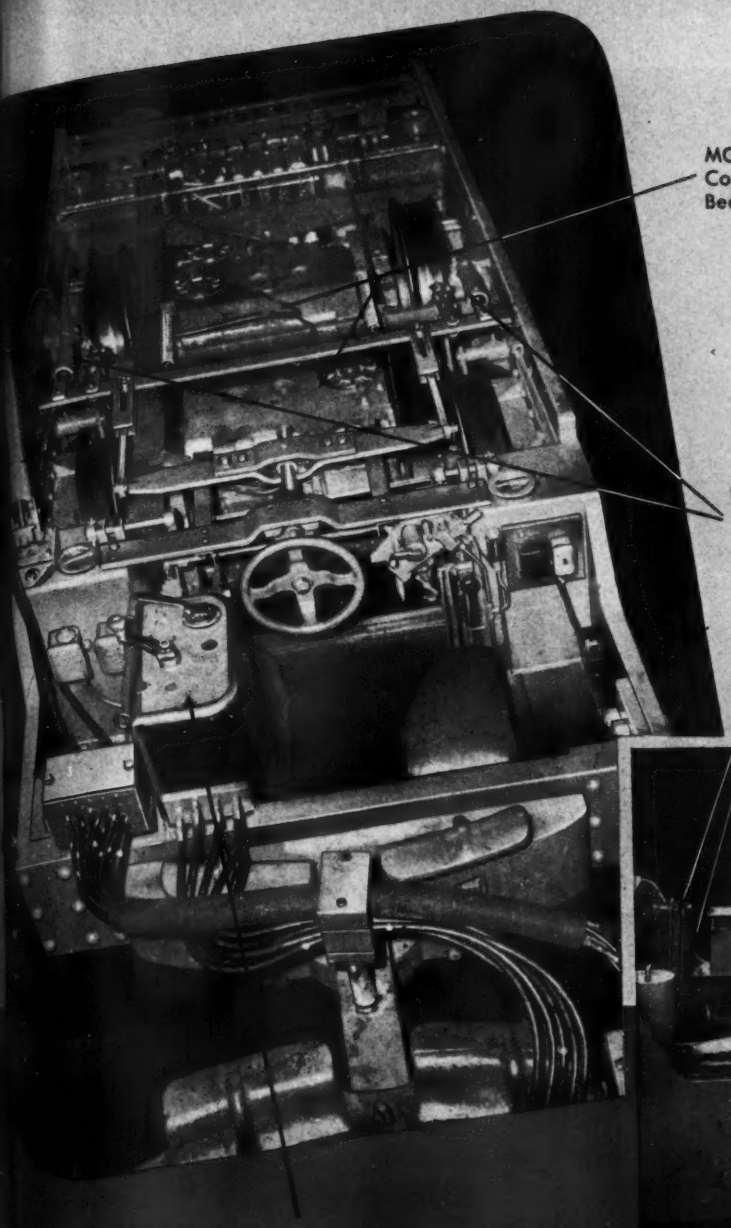
**RESISTANCE**— Heavy duty, designed for smooth acceleration and ample current carrying capacity.

**OVERLOAD PROTECTION** — Protect motors with magnetic or hand reset Overload Relays.

**CONTACTORS** — Eliminate destructive arcing in controller by using Contactors for acceleration.

HEADLIGHTS — Open or permissible type for Gathering or main Haulage Locomotives.

INCREASE TONNAGE . . . Connect your Locomotives in Tandem, either permanent or as separable units. Control equipment for any weight locomotive. Rehabilitate your locomotives with standard Jeffrey Renewal Parts.

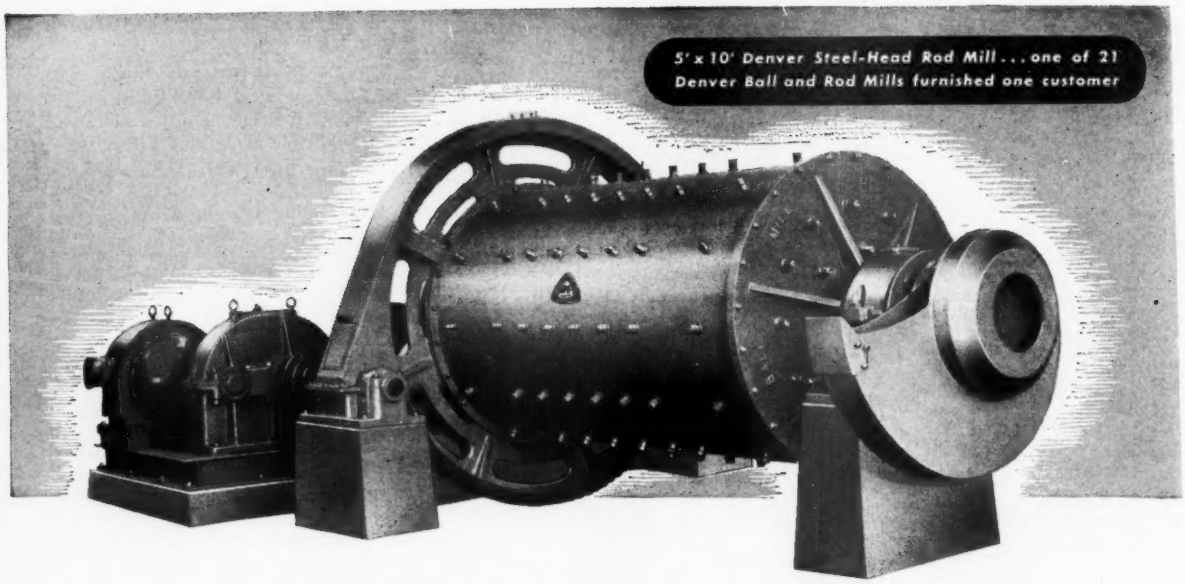


MOTOR PARTS — Armature and field Coils, Commutators and Refills, Gears, Pinions and Bearings.

HYDRAULIC BRAKES — Easily applied on Haulage Locomotives and essential on Tandems.

LOCOMOTIVES—May be separated by disconnecting Cable and Hydraulic Hose at Terminal Blocks and Hydraulic Connection Blocks.
Cross connections supported on Tandem Drawbar to provide flexibility—eliminating cable and hose breakage.

CONTROLLERS — Drum, semi-magnetic or full magnetic dependent upon type of Control desired.



5' x 10' Denver Steel-Head Rod Mill . . . one of 21 Denver Ball and Rod Mills furnished one customer

# DENVER *Steel-Head* BALL-ROD MILLS

**4-TIMES GREATER STRENGTH THAN CAST IRON**

Denver Ball and Rod Mills are made with cast-steel heads integral with trunnions, giving 4-times greater tensile strength than cast iron. Steel-head design permits a choice in type of construction . . . heads may be welded to the rolled steel shell or bolted to a steel flange welded to shell. • With its oversize bearings and extra strength of steel head a Denver Mill may be extended to a length twice the diameter, by addition of a shell section.

**DIAMETER MEASURED INSIDE LINERS**

Diameter of the Denver Steel-Head Ball-Rod Mills is measured inside liners . . . giving up to 28% greater capacity than mills with diameter measured inside shell.

**FLEXIBILITY WITH STANDARDIZED DESIGN**

With the standard Denver mills you have a choice of several types of feeders, discharges, trunnions, and drives . . . a combination may be selected to fit your particular problem, without the high cost of specially built mills. • You can depend upon obtaining "Standard—Reliable—Efficient" performance with Denver Steel-Head Ball-Rod Mills...write, now, to any one of the conveniently located Deco offices, for Bulletin B2-B4.

*Manufacturer of the* **DENVER "SUB-A"** *Flotation Machine...*

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*"The firm that makes its friends happier, healthier and wealthier"*

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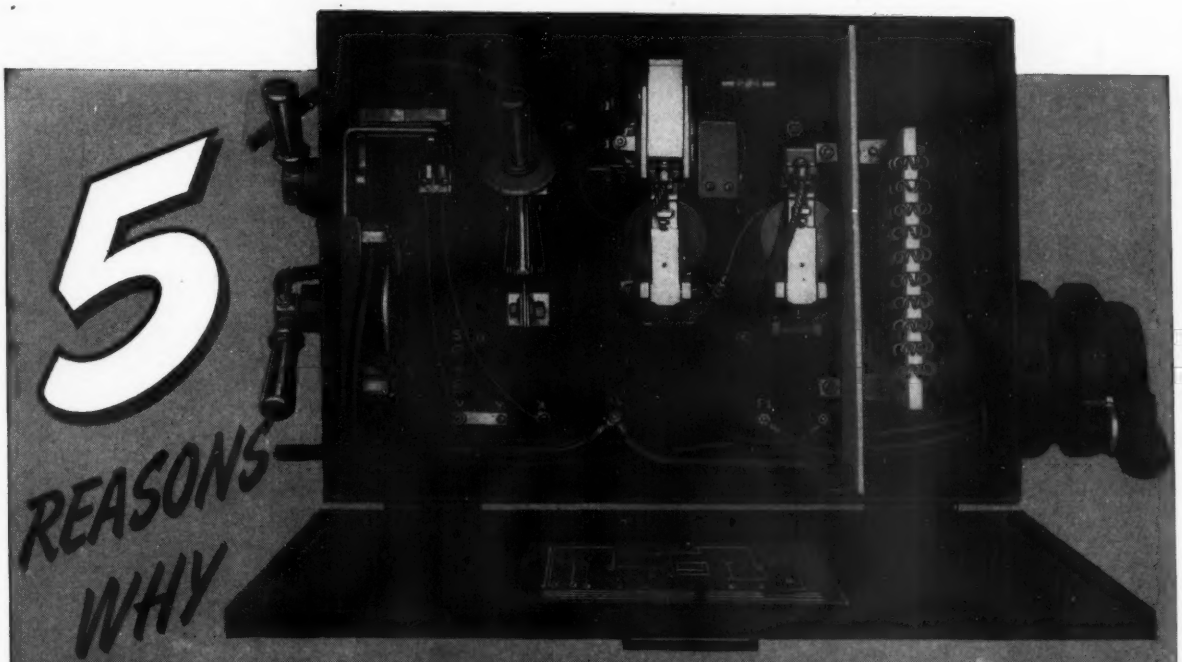
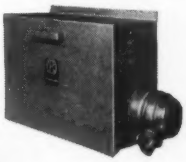


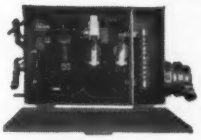
# 5 REASONS WHY

## O-B Motor Starters Stand Up Under Heavy Mining Service

1. **Rugged Steel Case Withstands Mine Usage.**



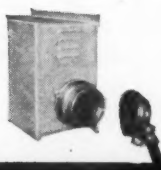
2. **Simple Parts Arrangement Affords Quick, Easy Maintenance.**



3. **Positive Timing Circuit Assures Proper Operation.**

4. **Built-In Reversing Switch Interlocks For Safety.**

5. **Fool-Proof Attachment Plugs Permit Fast Motor Connections.**



3832-M

*Specify O-B Motor Starters For All Motor-Driven Equipment—They're Designed to Stand Up Under Heavy Mining Service.*

Ohio Brass

MANSFIELD, OHIO

CANADIAN OHIO BRASS COMPANY, LTD.
NIAGARA FALLS, ONTARIO

# Get the facts in Frisco!

You are cordially invited to visit Booth No. 911
at the Metal Mining Exposition to inspect the
latest developments in Roto-Clone Dust Control
Equipment and Cycoil Air Cleaners.

**AMERICAN AIR FILTER COMPANY, INC.**
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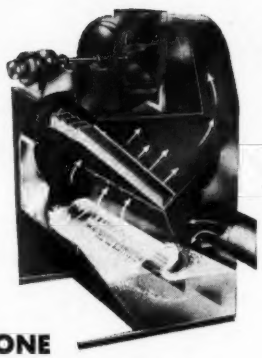
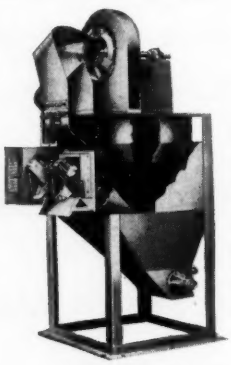
In Canada: Darling Bros., Ltd., Montreal, P. Q.

## On display for your inspection will be . . .

### TYPE N ROTO-CLONE

A full scale operating model will be available for inspection. It will be a Unit No. 8 of 8000 CFM capacity showing in complete detail the principle of hydro-static precipitation. See for yourself how the Type N, which recycles its own water, cleans dust-laden air without the aid of a single moving part.





### TYPE W ROTO-CLONE

Here's an opportunity to inspect a cut-away section of the famous Type W Roto-Clone. It will be a Model No. 8 of 1500 CFM capacity, equipped with automatic sludge ejector. This dynamic precipitator combines the dual function of exhauster and separator and with the addition of water sprays offers the highest efficiency in the collection of fine dust particles.

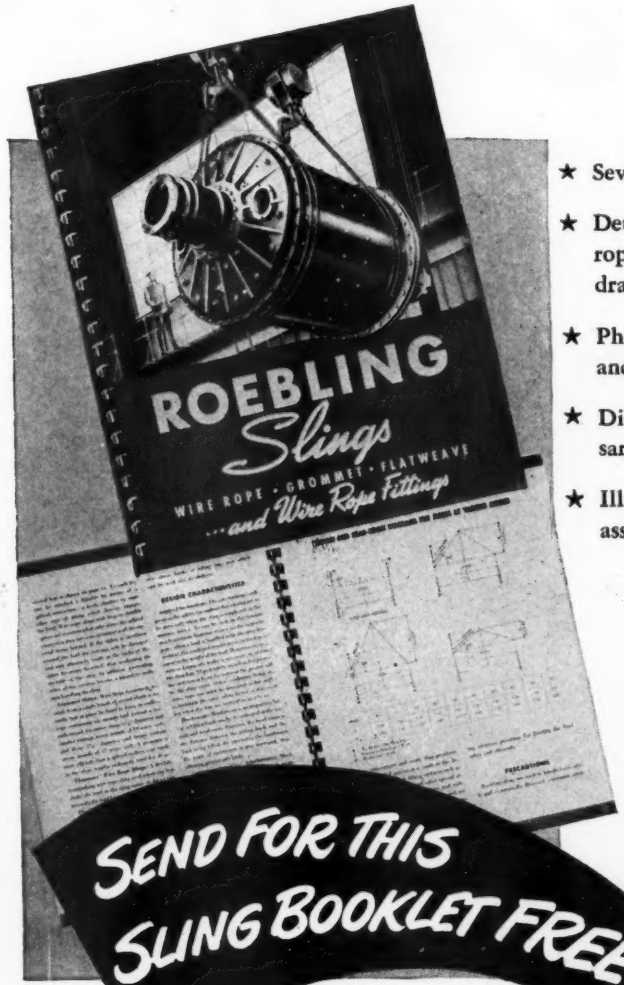
### CYCOIL OIL BATH CLEANER

A full scale No. 12 WO Cycoil Oil Bath Cleaner will be in operation. It is constructed throughout of plastic, permitting you to see how this unit provides 4 stages of cleaning. Designed for compressor and engine service, Cycoil delivers practically 100% dust removal efficiency in addition to serving as an intake silencer.

AAF

**ROTO-CLONE®**
**DUST CONTROL EQUIPMENT**

# HOISTING! LOADING! You can do them CHEAPER-BETTER




**IT'S ALL HERE** in the Roebling Sling Data Book . . . everything you want to know about slings to handle loads quickly, safely and economically.

★ **Seventy pages of facts about hoisting and loading:**

★ **Details about the design, construction and use of wire rope slings and sling accessories, described in words and drawings:**

★ **Photographs illustrating types of slings and accessories and showing typical hoisting operations:**

★ **Diagrams and tables that get down to brass tacks on necessary technical data:**

★ **Illustrated instructions for ordering wire rope and fittings assemblies.**

Whether you handle small simple loads or the largest, most expensive equipment, the *right* slings, *used* right, can help you improve and speed up operations all along the line.

Write today for your free copy of this easy-to-use, practical book. It may help you as it has helped others from coast to coast to win new efficiency at new low cost. Write for booklet A-900, or simply fill in and mail the coupon below.

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TRENTON 2, NEW JERSEY
*Branches and Warehouses in Principal Cities*

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**A CENTURY OF CONFIDENCE**

*★ WIRE ROPE AND STRAND ★ FITTINGS ★ SLINGS ★ SUSPENSION BRIDGES AND CABLES ★ AIRCORD, AIRCORD TERMINALS AND AIR CONTROLS ★ AERIAL WIRE ROPE SYSTEMS ★ ELECTRICAL WIRE AND CABLE ★ SKI LIFTS ★ HARD, ANNEALED OR TEMPERED HIGH AND LOW CARBON FINE AND SPECIALTY WIRE, FLAT WIRE, COLD ROLLED STRIP AND COLD ROLLED SPRING STEEL ★ SCREEN, HARDWARE AND INDUSTRIAL WIRE CLOTH ★ LAWN MOWERS*

John A. Roebling's Sons Company
Dept. 331, Trenton 2, New Jersey

Gentlemen: Please send my free copy of the Roebling Sling Data Book.

Name_____

Title_____

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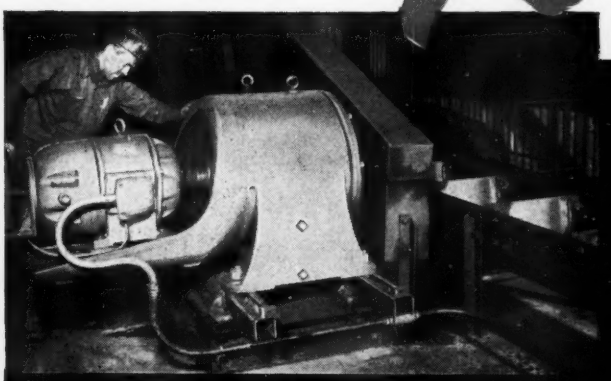
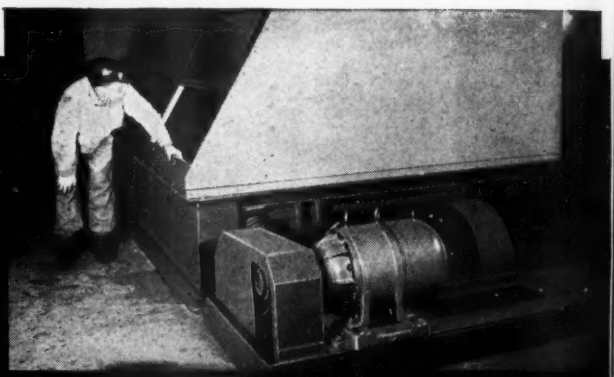
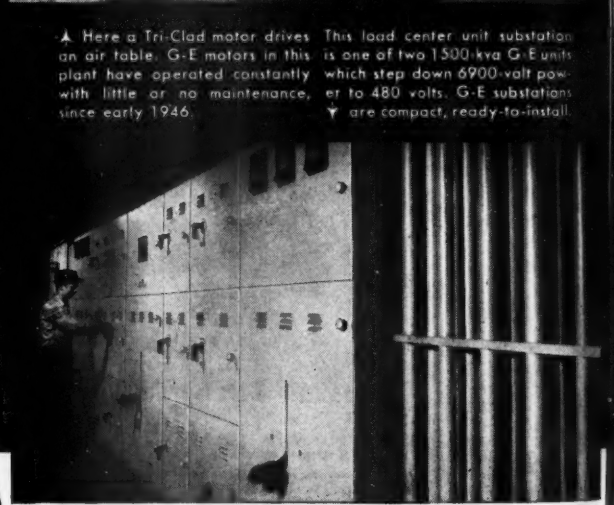
# Availability for Service: 100%!



▲ Here a Tri-Clad totally enclosed, fan-cooled motor drives one of the plant's conveyors. Other G-E motors run washers, vibrators, sizing screens.



▲ Here a Tri-Clad motor drives an air table. G-E motors in this plant have operated constantly with little or no maintenance, since early 1946.

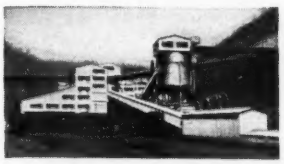


This load center unit substation is one of two 1500-kva G-E units which step down 6900-volt power to 480 volts. G-E substations ▼ are compact, ready-to-install.

**Equipment**

**...to cut coal-handling costs per ton!**

**In this ultra-modern colliery, G-E Tri-Clad motors work 90 hours per week, with practically no maintenance—power costs average only $.021 per ton.**



Two and a half years ago, the Dorrance Colliery of the West Virginia Coal and Coke Company was put in service as part of the Company's multi-million dollar modernization program.

In choosing motors to drive the processing machinery—most of which is located in dusty atmospheres—the operators wanted maximum protection against corrosive effects and clogging action of dust and dirt, which can cause equipment shutdowns. That's why they selected General Electric totally enclosed, fan-cooled motors—more than 90% of the 200 motors installed. These G-E motors—most of them of Tri-Clad* construction—have since run up a record of *100%* service availability.

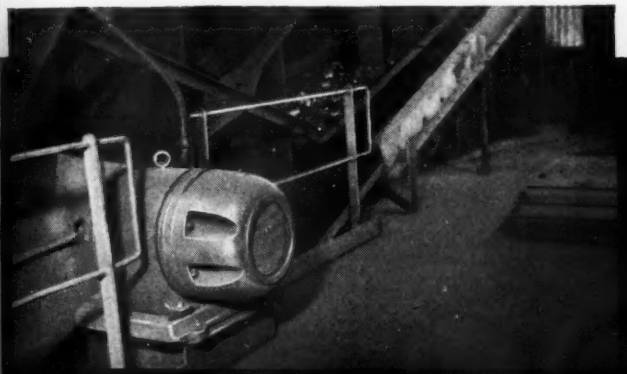
Also contributing to the colliery's high production are its modern G-E unit substations installed at strategic points to maintain operating continuity and assure full voltage at the motors.

For close co-ordination of the entire plant operation and for most efficient utilization of manpower, control of all motors is centralized in three G-E Cabinetrol* units.

As a result of the efficient use of electricity throughout the plant, the colliery handles 800 tons of R.O.M. coal per hour, and power costs have been kept down to only $.021 per ton.

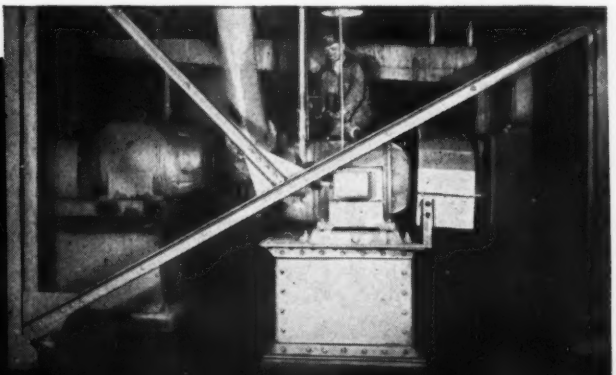
G-E engineers, thoroughly familiar with coal mining and preparation, can help you apply the properly co-ordinated electric equipment to cut your maintenance and power costs. As a first step, call the G-E office nearest you. ***Apparatus Dept., General Electric Company, Schenectady 5, N. Y.***

**Reg. U.S. Pat. Off.*



▲ Dust in the atmosphere around this shaker screen does not affect this Tri-Clad totally enclosed fan-cooled motor.

Here a 750-kva G-E unit substation, 6900-2400 volts, supplies power to a rotary converter in a drift mine as well as to an ▼ aerial tramway.



▲ Only routine inspection has been needed on this colliery's G-E motors since their installation. Shown are two Tri-Clad motors in the pump room.

This G-E Cabinetrol assembly is one of three master control sections in the plant. G-E metal-clad motor-starter units protect personnel, save installation time. ▼

# GENERAL ELECTRIC

667-60

# Alcoa Aluminum Roof Beams

## *save you time and money*

### Light! Compact! Acid-resistant! Strong!

Your timbermen will like the ease of setting Alcoa Aluminum Roof Beams. Your miners will like the safety of working beneath them! You will like the low cost over the years of using and re-using Alcoa Aluminum Roof Beams.

They're light in weight. A 4-inch H-beam of aluminum weighs only 4.85 pounds per foot. Yet it has the strength to support your working-face roofs over long spans. Compact, they save as much as 2″ of working height over wood beams.

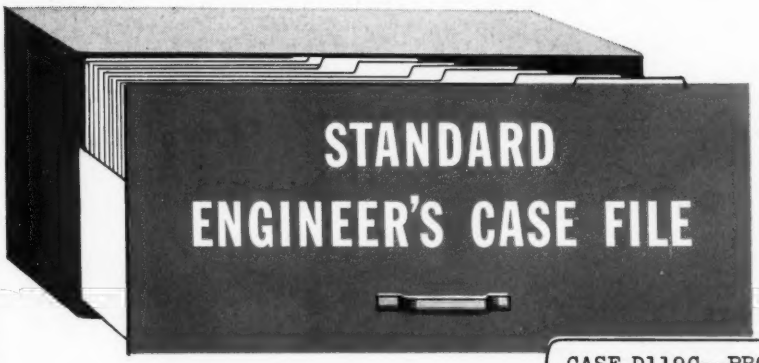
Alcoa Aluminum Alloy 61S-T6 beams are impervious to fungus and rot, resist the acids in mine water.

Although immediate delivery is not possible in all cases, due to the current metal shortage, you can lay your plans for future light-weight timbering. Figure now on reducing timber weights and production costs.

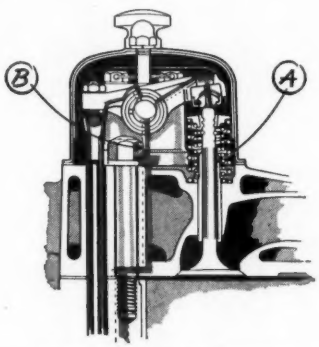
Ask your mine supply house for Alcoa Aluminum Roof Beams. Or write to ALUMINUM COMPANY OF AMERICA, 1478 Gulf Building, Pittsburgh 19, Penna. Sales offices in 54 leading cities.

**ALCOA** FIRST IN **ALUMINUM**

ALCOA ALUMINUM 1888 1948 60 YEARS OF SERVICE



## CASE D119C--PROVIDING GOOD VALVE ACTION IN DIESEL ENGINES.




DIESEL ENGINE VALVE ASSEMBLY

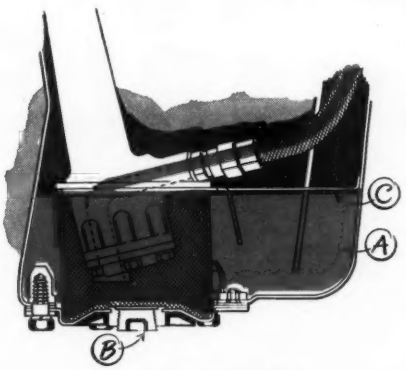
When Diesel engines, operating in tough heavy-duty service, were lubricated with compounded RPM DELO Diesel Engine Lubricating Oil, valve stems and guides did not gum up. They received thorough lubrication at all times and wear was negligible. RPM DELO Oil is recommended for all types of Diesels. Comes in several viscosity grades to meet all conditions.

A. Specially selected oxidation-resistant base stocks and special compounds prevent formation of gum and lacquer . . . oil film adheres to hot or cold metal surfaces.

B. Detergent compound keeps oil passages clean and open . . . and allows free flow of adequate supply of lubricant to wear points.

RPM DELO Diesel Engine Lubricating Oil is non-corrosive to all bearing metals. This quality and high stability assure sound bearings in Diesels for long service periods.

## CASE D119D--KEEPING PARTS CLEAN AND REMOVING CONTAMINANTS FROM DIESEL ENGINES.




DIESEL ENGINE CRANKCASE

Cylinder walls, pistons, bearings and other parts of Diesel engines in heavy-duty service remained free of lacquer, and all contaminants flowed out with drainings when RPM DELO Diesel Engine Lubricating Oil was used.

A. A special compound in RPM DELO Oil loosens and removes lacquer and other deposits from parts and oil passages . . . and they stay harmlessly dispersed in the oil.

B. The finely dispersed contaminants, including condensate and dust, flow out freely when crankcases are drained.

C. Another compound in RPM DELO Oil prevents foaming —allows accurate measurement of oil levels and delivery of sufficient lubricant by oil pumps.

The engine-cleaning qualities of RPM DELO Oil help reduce wear on parts and prolong greatly the operating periods between engine overhauls.

For additional information and the name of your nearest Distributor, write

**STANDARD OIL COMPANY OF CALIFORNIA**

225 Bush Street, San Francisco 20, California

**The California Oil Company**
Barber, New Jersey

**The California Company**
17th and Stout Streets, Denver 1, Colo.

**Standard Oil Company of Texas**
El Paso, Texas

DIESEL ENGINE RPM DELO LUBRICATING OIL

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CHECK!

- ✓ YOUR MINES
- ✓ YOUR CONSTRUCTION JOBS
- ✓ YOUR SHIPYARDS
- ✓ YOUR MANUFACTURING PLANTS
- ✓ YOUR RAILROAD SHOPS

Thor

WIDELY KNOWN IN PORTABLE

DON'T MISS THOR'S NEW SHOW TOOLS!

AMERICAN MINING CONGRESS HEADQUARTERS
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THOR'S GREAT TOOLS—IN THEIR 55TH YEAR—ARE EVERYWHERE!

# IS THE MOST TRADE NAME POWER TOOLS!

**INDEPENDENT PNEUMATIC TOOL COMPANY**

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Thor PORTABLE POWER TOOLS

SERVING THE MINING INDUSTRY FROM A LARGE LOS ANGELES FACTORY

CHISEL POINT

# MINER'S PICKS

## with BOWDIL'S *Interchangeable* POINTS

**THE RIGHT HEFT AND A SHARP POINT ALWAYS**

Bowdil Miner's Picks fill a specific need in the mine field for a well-balanced long-life tool with proper weight at a reasonable price.

The heads are forged from special steel and properly designed for weight and balance.

The points of heat-treated alloy-steel give long service and are interchangeable, permitting quick replacement of worn points.

**PARTS LIST**

| Part No. | | |
|---|---|---|
| 600 | Miner's Pick Complete with Points (Light) | —2½ lbs. |
| 601 | . . . . . Pick Head (Light) | |
| 602 | . . . . . Pick Point, Square Point | |
| 603 | . . . . . Pick Point, Chisel Point | |
| 604 | . . . . . Handle | |
| 1111 | . . . . Rivet for Pick Head and Handle | |
| 610 | Miner's Pick Complete with Points (Heavy) | —3 lbs. |
| 611 | . . . . . Pick Head (Heavy) | |

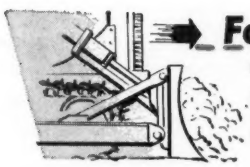
SPIKE POINT

THE **BOWDIL** COMPANY
CANTON, OHIO

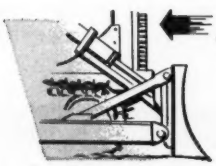
# POWER and SPEED

## with the AC HD-19 and BAKER Bulldozer

**Less Shifting** The torque converter does the shifting *automatically* — changes tractor speed in relation to load and grade. Forward and reverse levers are all operator is concerned with — he need not even select the desired travel gear as the torque converter sets the pace. That's why there's no other bulldozer on tracks or rubber that will outproduce the HD-19 and Baker 'Dozer.



**Faster Forward** The load governs travel speed, not the operator s judgment. When bulldozer is in forward range, travel speed is as high as load and grade will permit. Results in faster dozing cycles, more yardage per shift and greater operator efficiency.



**Faster Reverse** High reverse is almost instantaneous, for under "no load", tractor zooms into high at 7 miles per hour to return for another pass. Two step shifting not required — merely shift unit into reverse and the torque converter does the rest,

**BAKER**

SPRINGFIELD · ILLINOIS

# UNIFORM

## QUALITY "CHROME-MOLY" STEEL Ball Mill Liners

Uniform analysis . . . uniform quality. From Brake Shoe's metallurgical and Research Department has come for the first time anywhere, a method of producing "chrome-Moly" steel ball mill liners that are the same every time. Gone is the bugaboo of unreliability—now you can depend on uniform performance.

When operating conditions are such that breakage resistance is secondary to sheer abrasion resistance (plus good toughness), "chrome-moly" steel liners often show a lower cost per ton of ore milled than austenitic manganese steel. Here's a comparison of results under identical conditions in a copper mine.

| Cost per Ton Ore Milled | Manganese Steel | Amsco "Chrome-Moly" |
|---|---|---|
| | .007529 | .006839 |

And here's a comparison between Amsco "Chrome-Moly" liners and a competitive Chromium-Molybdenum set. In this case Amsco had the harder service of handling finer grinding.

| Cost per Ton Ore Milled | Competitor | Amsco "Chrome-Moly" |
|---|---|---|
| | .023 | .0102 |

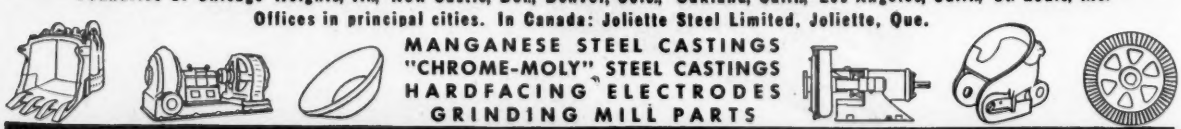
***C-635. Typical shell, manhole, throat and end liners for 6′ ball mill for ore milling.***

Liners of austenitic Manganese Steel, chromium-manganese steel, and now "Chrome-Moly" (Chromium-molybdenum steel)—they are all part of Brake Shoe's constant effort to provide you with equipment parts of the metal best suited to your needs.

AMERICAN Brake Shoe COMPANY

**AMERICAN MANGANESE STEEL DIVISION**
CHICAGO HEIGHTS, ILL.

Foundries at Chicago Heights, Ill., New Castle, Del., Denver, Colo., Oakland, Calif., Los Angeles, Calif., St. Louis, Mo.
Offices in principal cities. In Canada: Joliette Steel Limited, Joliette, Que.



MANGANESE STEEL CASTINGS
"CHROME-MOLY" STEEL CASTINGS
HARDFACING ELECTRODES
GRINDING MILL PARTS

DIPPERS DREDGE PUMPS CRUSHER PARTS CHAINS SOLIDS PUMPS BUCKETS WHEELS

# LESS WORK FOR HIM... MORE FOOTAGE FOR YOU

The Blue Brute WPMS Drifter keeps up a steady, hard-slugging pace with mighty little attention from your runner. He simply adjusts the light, shell-mounted Worthington Pneu-Motor for proper feeding. That holds the machine continuously to the rock, taking up all the slack and never crowding rotation.

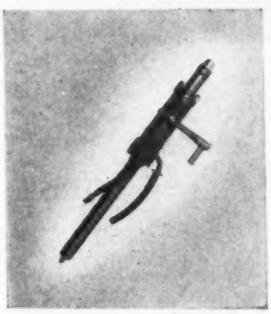
Your runner has a lot less trouble with stuck steels, too, because the WPMS short-strokes under heavy loads. And with the one-piece chuck-sleeve reducing friction, holding alignment better and allowing the piston to hit cleaner and harder, he'll save time and money for you on every drilling cycle.

**Other**

**Blue Brute Drifters**

The WPM (Pneu-Motor on Drifter) and WHC (Hand Crank) complete the Blue Brute Drifter family. Like the WPMS, they come in 3", 3½" and 4" cylinder sizes, with mountings standardized to take all three sizes. And all three models are fast, vibration-free drillers that will cut away more footage for you at less cost.

Get the facts that prove *there's more worth in a Blue Brute.* Write for literature on the complete line of Blue Brute Mining Equipment. H8-21



***BLUE BRUTE STOPER***

Self-Rotating Model WR-31 is well balanced, easily handled and has many other features that make it a favorite with mining men. Fully described in Bulletin H-1200-B30.

# BUY BLUE BRUTES

Semi-Portable Compressors. Drifters with Feed Motor Incorporated. Drifters with Feed Motor on Shell. Hand-Crank Drifters. Stopers. Hand-Held Rock Drills.

**WORTHINGTON**

Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division, Holyoke, Mass.

Distributors in all principal cities

# NEW MACK hauls 22½ ton pay loads

● It's "bottoms up" with heaping loads and "profits up" through low-cost hauling when Mack Model LV takes over on tough excavating and strip-mining jobs.

Clear through, in every part, this big, new Mack is engineered to move more yardage per load and more loads per hour.

There's power in abundance with its 200 h. p. diesel engine. Massive strength in its reinforced, alloy-steel, all-welded frame. Assured traction with Mack's exclusive Power Divider.

Mack Duplex transmission gives added mastery over grades and difficult terrain. Power steering and air assist clutch contribute to easy handling and high maneuverability. Final reduction of full-floating Planidrive type, is strong and rugged without excessive weight. Roomy, all-steel cab has offset driver's seat for better vision; is durably built for long-lasting comfort. Planned accessibility means lower maintenance, easier servicing.

Mack off-highway engineers will gladly advise you on the proper application of Model LV to your particular excavating job. Write or call your nearest Mack branch or dealer.

**Mack**

**Trucks for every purpose**

Mack Trucks, Inc., Empire State Building, New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts. In Canada, Mack Trucks of Canada, Ltd.

# DU PONT INTRODUCES *the "Series B"*

## A New and Improved Series of Delay Electric Blasting Caps for Contractors and Ore Miners

**These new caps** offer contractors and underground metal miners new speed and even greater dependability in blasting operations. "Series B" caps are designed to eliminate misfires due to arcing or "water hammer." They bring increased reliability under the most adverse blasting conditions: high voltages, parallel circuits, and under water.

"Series B" caps embody all the advantages of the present line of Du Pont Delay Electric Blasting Caps: double crimp casing, rubber plug closures, nylon-insulated leg wires, aluminum-foil shielded shunts. Dimensions are the same . . . as are the 10 delay periods.

"Series B" caps can be used in any of the usual hook-ups . . . series, parallel-series, or parallel . . . with or without instantaneous blasting caps . . . and under wet or dry conditions. They fire with equal certainty on low, medium, or high voltage.

If you employ rotational firing—particularly if you use high voltage and have wet work—investigate Du Pont "Series B" delays. Ask any Du Pont Explosives representative for full information about this *new* product of Du Pont Explosives Research.

**E. I. du Pont de Nemours & Co. (Inc.)**
**Explosives Dept., Wilmington 98, Del.**

# DU PONT EXPLOSIVES

*Blasting Supplies and Accessories*

DU PONT
REG. U.S. PAT. OFF.

**BETTER THINGS FOR BETTER LIVING**
**. . . THROUGH CHEMISTRY**

*Be sure to visit the Du Pont exhibit—Booth 603—at the Metal Mining Convention—San Francisco—September 20-23, 1948.*

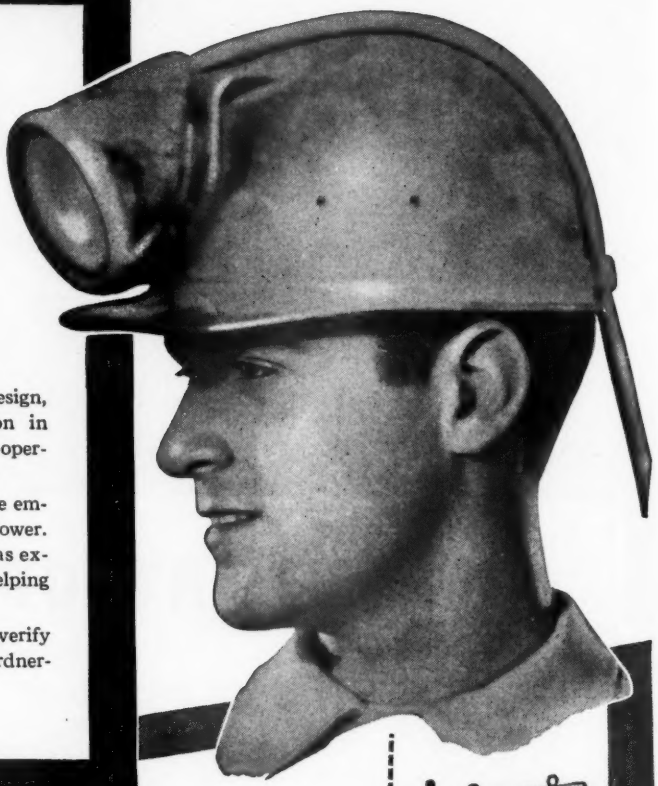
# "I'm PROUD to use equipment like this!"

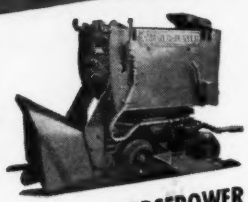
Gardner-Denver equipment is doing much to make mining attractive to young men about to choose a life occupation. There are two main reasons—

First, Gardner-Denver equipment has the quality which appeals to intelligent men—quality which includes excellence of design, high-precision craftsmanship and perfection in every detail. Here are machines worthy of an operator's finest skill!

Second, Gardner-Denver equipment puts the emphasis on *brain work*, not on mere muscle power. Gardner-Denver advanced engineering—as expressed in rock drills, sinkers and loaders—is helping to make mining truly a machine process.

These facts make sense—as you can easily verify for yourself by talking to the men who use Gardner-Denver equipment.





## "TWENTY HORSEPOWER UNDER MY HAND"

Gardner-Denver GD14—a safe loader with a "big bite" and wide cleanup range—takes the hard work out of mucking.

## "THIS DRIFTER IS ALMOST HUMAN"

Gardner-Denver CF89H Motor Feed Drifter—automatically feeds itself in accordance with character of ground—easy on the set-up—vibration-free.

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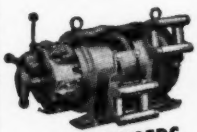
Gardner-Denver R104 Stoper—with perfect physical and operative balance—a favorite drill where footing is precarious.



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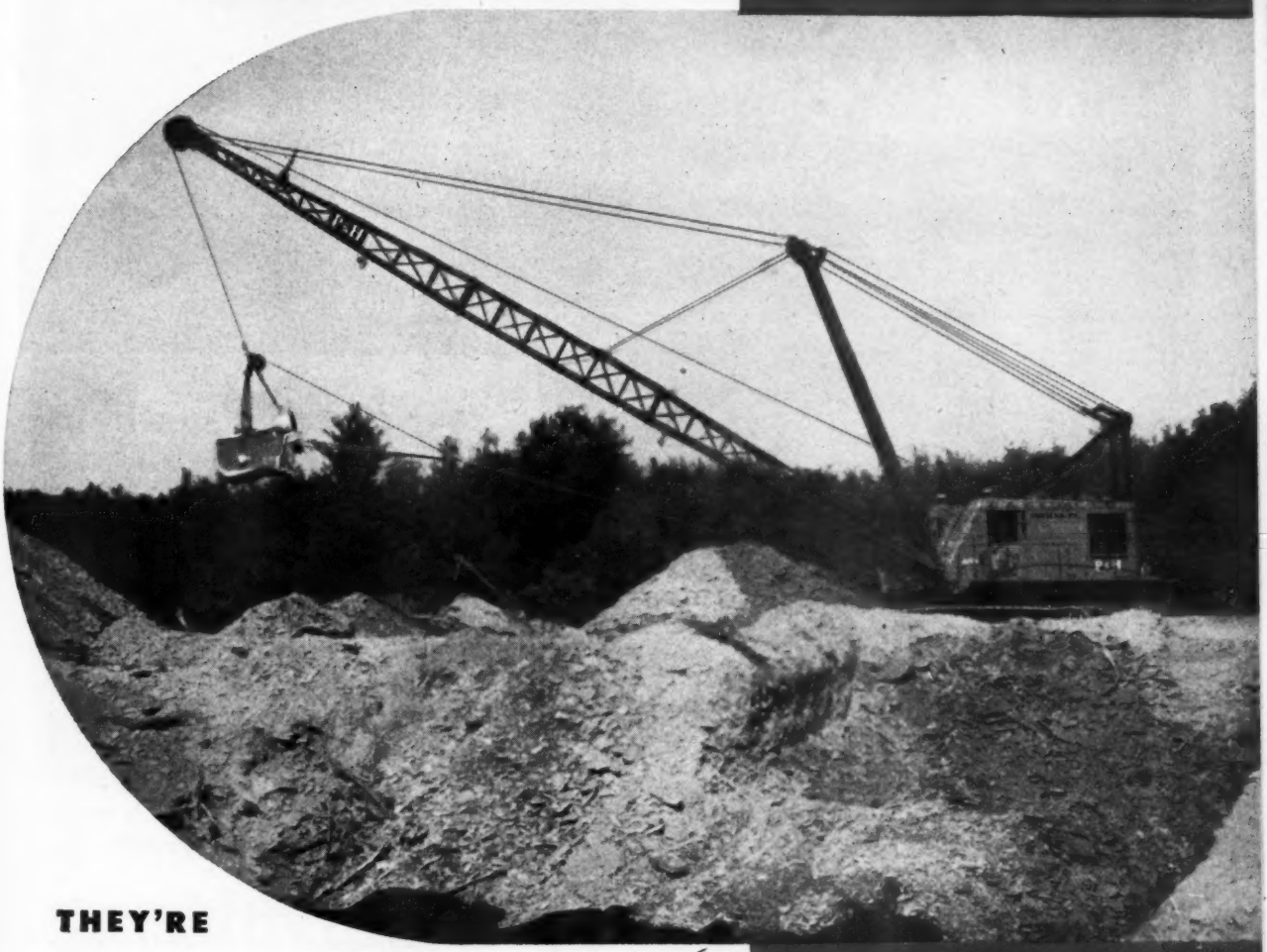

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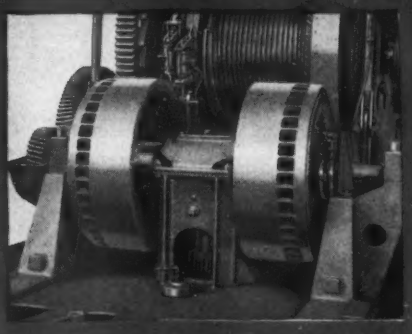

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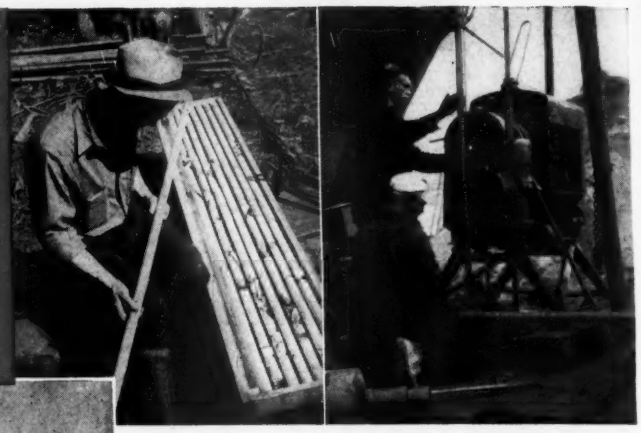

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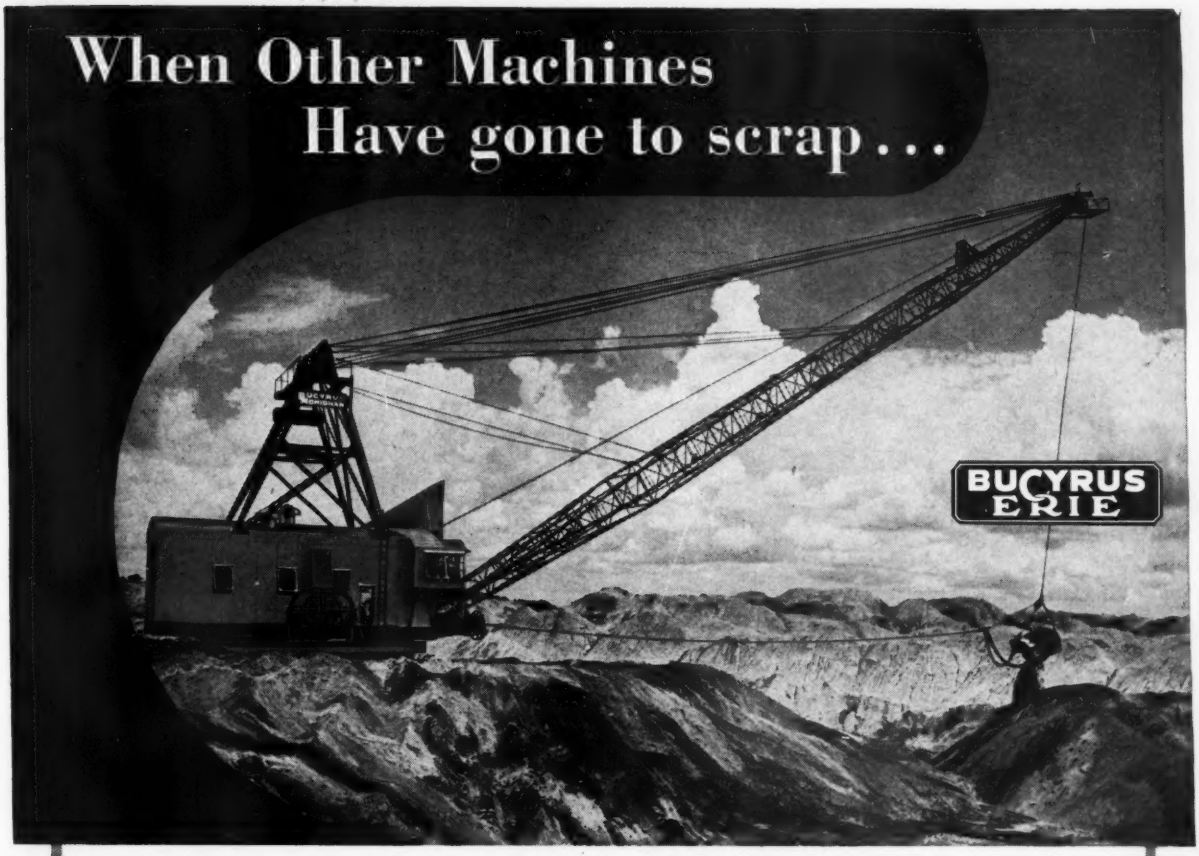


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# Editorials

SHELDON P. WIMPFEN, *Editor*

September, 1948

## Annual Inventory

IN less than a hundred years Americans have stridden swiftly from an age of comparative darkness lit by pine knots and candles to an era of the brilliant illumination of electric bulbs and fluorescent lights. The oxcart has been supplanted by streamlined trains, automobiles, and swift airplanes. Conveniences almost undreamed of a century ago are now accepted as necessities.

Central heating and inside plumbing have largely replaced the fireplace and well. Americans have more of the facilities of easier living and in greater quantity than do any other people. Paralleling the introduction of these and other numerous aids to better living have come greater health, longevity, enlightenment, literacy, and good will towards others.

Surely this miracle of achievement has an explanation. Great natural resources are not the answer as Africa, China, India, and Russia are similarly well off in this respect. It isn't because we work harder, as the people of most other nations work much harder than we do. Possibly we have more physical and mental energy than other people, and certainly we make more effective use of that energy.

The primary reason for our impressive accomplishments in the use of human energy is the freedom of Americans to direct their efforts according to individual desire, with commensurate rewards for the most efficient application of initiative, imagination, and ability. The kind of government set up by this nation's founders permits and encourages the free action of each citizen as an individual, in the understanding that only the individual creates human energy and has competent and complete control over that energy.

Herbert Hoover, in his homecoming address on his 74th birthday, expressed clearly the basic reason for America's greatness in these words. "The meaning of our word 'America' flows from one pure spring. The soul of our America is its freedom of mind and spirit in man. Here alone are the open windows through which pours the sunlight of the human spirit. Here alone is human dignity not a dream, but an accomplishment."

Perhaps more than any other line of endeavor does the mining industry exemplify the achievements to be realized by the free action of the individual American. Mines have been found, financed, and equipped by men of imagination who strove for the rewards to be gained from their efforts. To provide better ways of doing the job, creative men took up the task of producing the required tools and machinery. A maximum of encouragement and a minimum of control fostered success.

For more than fifty years the men who find and develop mines have worked hand in hand with those who design, build, and supply the proper equipment to simplify each task. And for the past fifty years the mining industry, through the American Mining Congress, has kept a watchful eye and taken action to resolve its problems and to seek Government policies that will encourage its continued development and growth. Improved operating methods and safer practices have been given continuous consideration with the objective of more economic production of minerals with fewer accidents.

A series of annual conventions and expositions have served the purpose of bringing the elements of the mining industry together to solve the perennial question—"How can we do the job better?" New methods and equipment and dissemination throughout the industry of the techniques of successful practice have been the result of these meetings.

Equally important in these conventions are the forums where national mineral policies and their effect upon the mining industry are considered. Here many angles of tax problems, labor legislation, social security laws, tariffs, stockpiling, and other vital problems are brought sharply into focus for study and the development of constructive programs to advance the welfare of mining. Such a democratic procedure is only possible in a nation of free men.

The progress of these past fifty years has been more than noteworthy. With maintenance of the freedom to think and act as individuals, American mining men in the coming half century will forge ahead to still greater records of achievement and service to the country.

Looking northeast. Open-pit conveyor and ore bins in foreground. Inspiration main shaft in center

# Open-Pit Operations At Inspiration

## Two Pits Supply Forty Per Cent of Mine Production At Low Cost

By A. E. MILLAR

Pit Development Superintendent
Inspiration Consolidated Copper Company

IN the Globe-Miami District of Gila County, Ariz., about 90 miles east of Phoenix the plant and property of the Inspiration Consolidated Copper Co. are located. The ore body is located at or near the contact of the Schultz granite with Pinal schist. The ore itself occurs in both schist and granite, and is a result in nearly all cases of secondary enrichment.

For better than three decades this company has conducted large-scale underground mining operations. Inspiration was one of the pioneers in the development of block caving as a method of mining, and has always been recognized as one of the leading exponents of this method of underground mining. However, again it is possible to demonstrate the truth of the ancient proverb, "Where there is no vision the people perish." Changing conditions have altered circumstances and some time ago it appeared that in addition to underground mining, there was a field for open-pit operations in the removal of a portion of the remaining Inspiration ore bodies. Subsequent study crystallized this thinking, and after the necessary preliminary planning, construction, development, and purchase of required equipment, open-pit mining operations were started at Inspiration in April 1948. It is expected that such operations will continue throughout the remainder of the life of this property.

No new or additional ore bodies are involved, but by open-pit operations Inspiration will remove certain sections of its present ore bodies.

Although it had been known for many years that a substantial portion of the Inspiration ore body came through to the surface in certain areas, it must be remembered that the development of heavy earth-moving equipment, shovels, bulldozers, and haulage trucks, has greatly advanced only during the past few years. Also, Inspiration caving methods were eminently successful in maintaining low mining costs, and there existed little incentive to change the method of mining.

As time went by and these surface areas were caved and mined, new problems arose. In the bottom of the caves and around the fringes, there remained a considerable tonnage of ore above that which had been extracted. Also, the cost of underground mining was increasing. Various schemes and methods were discussed and discarded, and it became more apparent that the adoption of open-pit methods, utilizing truck haulage, was the solution for recovering this ore and at a lower cost. From this point it was but a step to plan an open-pit operation for the entire area in question.

Open-pit operations will not entirely replace underground mining. In the future about 60 per cent of the ore mined will continue to come from underground mining, and the remaining 40 per cent will be produced from the open pit. Over-all mining production will not be increased, and pit operations merely replace a portion of the former underground tonnage.

The Inspiration ore body is a mixture of sulphide and oxide copper and for successful treatment by the ferric-sulphate leaching process, careful con-

trol of both sulphide and oxide content, as well as the over-all grade of the feed to the treatment plant, is essential. It was obvious that such control through selective mining and the control of waste could be more readily accomplished by open-pit mining methods than by underground block-caving methods, or by a combination of the two.

In planning the project, ore transportation from the pit to the main coarse crushing plant, located adjacent to the main shaft of the Inspiration mine, was the main problem. Ore delivered to the coarse crusher could not exceed 12 in. in size. Hence a primary crusher to reduce material which could pass through a 4½ yd dipper to this 12 in. size was necessary. Also, it was obviously essential to provide bin storage behind the primary crusher from which pit ore could be delivered at a controlled rate to the main coarse crushing plant via existing railroad facilities.

The location of the open-pit ore bodies is on the south side of the Inspiration ridge from the main treatment plants. It was early decided that truck haulage was desirable. Investigation showed that, by making a heavy cut through a convenient saddle in the ridge, a haulage road could be constructed on an up-hill grade of 7 per cent, over which pit ore could be delivered to the pit primary crushing plant on the north side of the ridge. From this point the ore could then be delivered via storage bins and railroad cars to the main shaft coarse crusher. This planned arrangement worked out well and no serious construction difficulties were encountered.

## Well-Planned Pit Development

The open-pit project at Inspiration is divided into two areas. One of these overlies what is known as the Live Oak ore body, and the other overlies what is known as the Colorado ore body. The long axes of the pits are northeast-southwest, and northwest-southeast, respectively. At the north end, the two areas, although close together, do not meet, being separated by the Bulldog Fault. In the Live Oak area little preliminary stripping was required in order to uncover ore. Some waste will be encountered at the southwest end. However, as this has a lower elevation, it need not be removed immediately. The surface dimensions of the Live Oak area are approximately 3000 ft in length and varying in width from 600 to 1200 ft. The depth of the final pit will vary from 200 to 300 ft. In the Colorado area considerable stripping is required before ore can be mined. This is especially so at the northwest end. The surface dimensions of the Colorado area are approximately 1800 ft in length and 600 ft in width. The depth will average 350 ft.

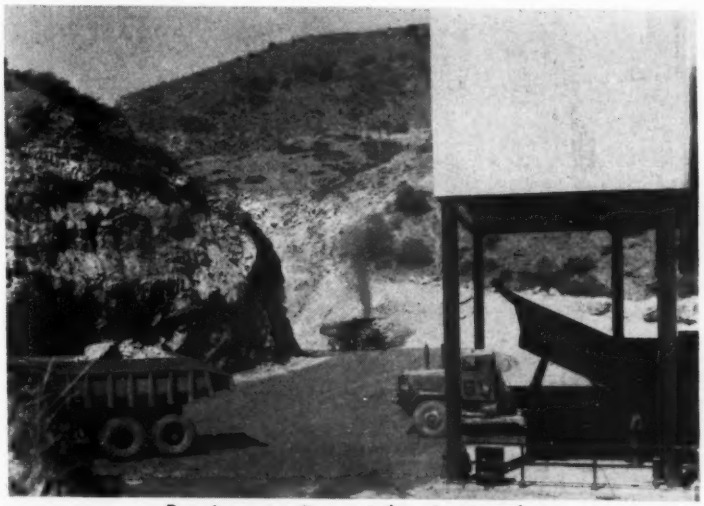
From underground plans and from prospect drill holes drilled from the surface, sections were prepared for both areas showing ore and waste and the respective assays. From these sections bench assay plans were prepared. An overall slope of 45 deg has been used in preparing all plans. Bench height has been established at 50 ft. Specific gravity of the material is similar to that in other mines in this area and results in a factor of 12½ cu ft per ton in place and 20 cu ft per ton broken. The over-all waste to ore ratio for the entire project is estimated at .7 to 1.

The average length of haul for ore will be three-quarters of a mile, and the maximum length of haul about one and one-quarter to one and one-half miles. Waste disposal areas are available close to the pit.

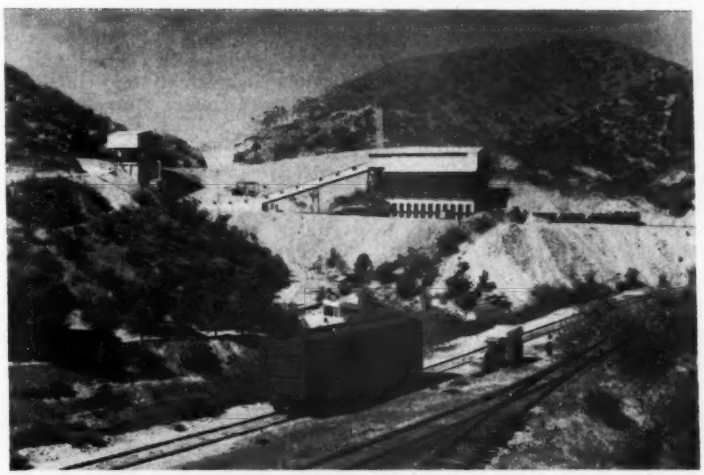
## Access and Haulage Roads

Roads for access to the pit and roads for ore haulage had to be established. The main haulage road was constructed outside of the pit limits, but as close to the pit as possible. This road is on a 7 per cent up-grade. It is a minimum of 30 ft in width and has been surfaced with tailings from the leaching plant. Separate level roads will lead from the main haulage road to the respective benches. This main haulage road lies on the southeast side of the Live Oak area, and the roads serving the Colorado area lie on the southwest side of that body. These two main haulage roads join at the north end and one road continues through two heavy cuts in order to maintain the 7 per cent grade and reach the primary crusher on the north side of the ridge.

It will be necessary at a later date



Dumping open-pit ore at the primary crusher



Looking southwest from coarse crushing plant to new open-pit primary crusher, conveyor, and ore bins. Tracks lead to coarse crushing plant close to Inspiration shaft

to carry the main haulage roads inside the pit proper; that is to say, the topography of the ground is such that when mining the lower benches, the main haulage roads pass inside the pit limits. Provision was made for this condition when the actual pit slopes were established. Service roads have been provided from the shop area to the pits. An access road from the present plant to the crusher and ore bin storage site is also provided.

## Crusher Ore Bins Store 5000 Tons

Pit ore is hauled by truck up a 7 per cent grade and arrives at the new crusher site at an elevation of 3968 ft. The crusher ore is crushed by a 42-in. gyratory crusher and is reduced to 6-in. size. The crushed ore is delivered by means of a 48-in. pan feeder on to a 36-in. belt conveyor. The vertical drop from the dumping point at the top of the crusher to the pan feeder is 62 ft. The crushed ore is conveyed up to ore bins which have a live storage of 5000 tons. From this point the material is loaded into railroad cars and transported to the main crushing plant, where it meets with the underground ore. The distance from the ore bins to the main crusher is about one-half mile. The latest type air-operated gates are used under the ore bins for loading the crushed material into the railroad cars. A train of 10 cars, each car holding 60 tons, can be loaded in a short period of time.

Essential preliminary work necessary for the installation of the crusher, conveyor, ore bins, railroad, etc., worked out satisfactorily. Excavation on the respective sites and also for the access roads and main haulage roads was started in March 1947. A total of 260,000 cu yd were moved. Planning was such that concrete work was started as the excavation progressed. In the crusher building, conveyor piers, and ore bins a total of 4000 yd of concrete was poured. All tests on the concrete showed a compressive strength of better than 3200 lb. Erection of the structural steel started as concrete work progressed. A total of 620 tons of structural steel was placed in these three structures. Installation of equipment was commenced before structural steel had been completed, and all was ready for operation by April 1, 1948.

## Shop Facilities

The garage, office, change house, warehouse, etc., pertaining to the pit are located at what is known as tunnel yard. This location is about one-half mile south of the lower end of the Colorado area. From this yard roads lead to the different sections served. This location has the added advantage of being close to the west end of the Miami townsite and is readily accessible for personnel.

Full service is available for all repairs and maintenance of haulage trucks and service trucks; also for bit sharpening, casing straightening, etc. Gasoline and Diesel-fuel storage and dispensing pumps have been provided. An up-to-date change house provides the workmen with facilities for proper hygiene. On the main floor of the warehouse building all supplies are stocked with the exception of tires and tubes. These are kept in the basement of the warehouse, which is an ideal place for storage of rubber. Only minor tire repair work is done at the shops. Recapping and vulcanizing of large sections will be handled by an outside shop.

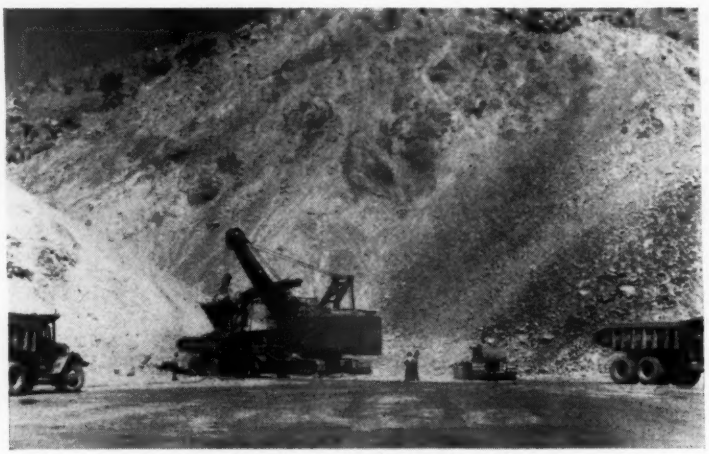
## Pit Equipment

There are two P&H 1400-type electric shovels used for loading. These shovels are equipped with 4-yd dippers, but can handle dippers up to 5-yd size. They operate on 2200 v, power delivered to the shovel by means of rubber-covered trail cables. These trail cables connect to shovel switch houses at the end of the benches. To date, these shovels have performed well. The loading rate is expected to be in the neighborhood of 4500 tons per shift. The independent propelling motor as installed in this shovel has a definite advantage over sliding gears, clutches, etc. The change from dig to propel is instantaneous. The drive on the hoist unit is from a very heavy-duty a-c motor. The amount of power on the hoist motor is regulated by the excitation supplied to a Magnetorque unit. Lowering of the dipper is by gravity. In addition to these two shovels, one 2-yd Diesel shovel is used for miscellaneous work.

For haulage purposes there are nine Dart trucks, Model 250-472 each capable of carrying a payload of 23 to 24 tons. The body is a Heil 14-yd box made self-dumping by means of Heil telescoping hoists. The power units in these trucks are Hercules DFXH Diesel engines with a displacement of 935 cu in., and with 240 hp developed at 1800 rpm, or 260 hp at 2000 rpm. Eight tires are required on the rear and two on the front; all are 20-ply tires, 1400 by 24-in.

In addition to these trucks there are four smaller service units. Each of these trucks is equipped for its own particular job, such as handling churn drill bits, field lubrication, water truck for sprinkling roads, and a small dump truck is available for handling stemming.

Three churn drills are used for drilling blast holes. Bits of 9-in. are used, and all holes are drilled 5 ft below the bench grade in order to assure sufficient explosives in the bottom of each hole to break the toe clean. To date the average spacing of the holes is 20 ft center to center. A horizontal distance from the bottom of the hole to the toe of the bench face of 30 to 35 ft is maintained. This spacing may be changed, depending on the type of ground encountered in the lower benches. In addition to the churn drills, there are two wagon drills equipped with X71 drifters. These are used for establishing benches and in any condition where excessive toe is encountered.



Truck loading on Bench 4000 Live Oak pit

Delivery of dynamite from the storage magazines is by truck haulage. Detonation of the holes is by Primacord. One line of reinforced Primacord is placed in each hole, and all holes connected to a trunk line of plain Primacord on the surface.

To date, the type of ground encountered has necessitated little secondary blasting and it is expected that this condition will prevail throughout the life of the pit.

Miscellaneous equipment includes a

(*Continued on page* 101)

# Concreting Practice at Climax

A 100-hp hoist moves muck in a concreted slusher drift

By ROBERT HENDERSON

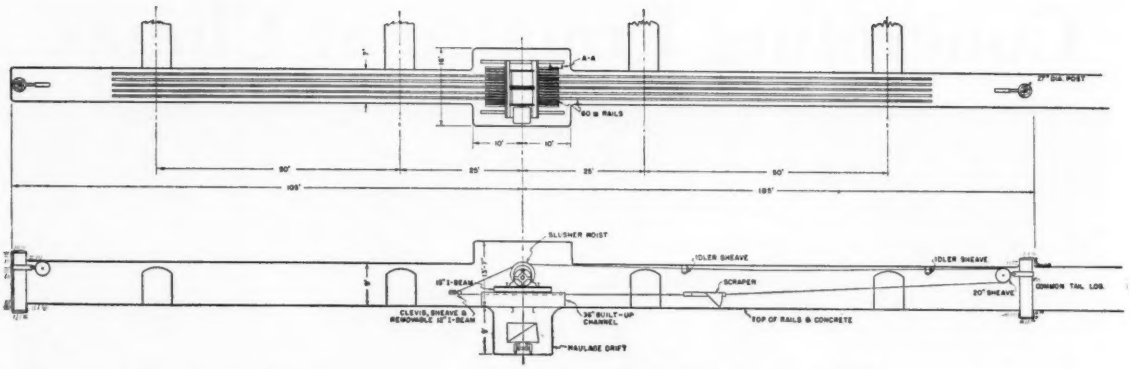
Mine Superintendent
Climax Molybdenum Co.

**World's Largest Molybdenum Mine at Climax, Colo., Uses Poured Concrete to Solve Ground Support Difficulties in Slusher Drifts, Fingers, Overcasts, Grizzly Chambers, and Around Chutes**

IN 1933 work was started on a few experimental slusher drifts on the White level under a caved block in an attempt to find a more economical method of handling the ore. Previously the ore had been handled through chutes and grizzlies but the coarseness of the caved muck made maintenance, blasting, and handling costs high. These slusher drifts were put in with the idea that larger material could be handled in them more cheaply than in the chutes and grizzlies but several problems came up that were not expected. Probably the greatest difficulty was found in trying to maintain the blocky ground. In the January 1941 issue of MINING CONGRESS JOURNAL a paper was published entitled "Progress of Slushing and Ground Support at Climax," by F. S. McNicholas, in which the concrete operations were clearly outlined. Some of the changes that have been made since that time are described in this paper.

The original slusher drifts were driven level, 8 by 8 ft, directly above and on both sides of the haulage drifts on 75-ft centers. Some of these slusher drifts were 150 ft long but most of them were 100 ft long. This has been found to be about the maximum economical length. The fingers were driven 5 by 5 ft on a 45 deg angle directly opposite each other on 50-ft centers along the slusher drifts. Later the slusher drifts were driven on 50-ft centers along the haulage drifts and the fingers were driven from one side of slusher drifts only.

In these raw slusher drifts the fractured rock was loosened by the continual blasting and the beating of the 5-ft and 6-ft scrapers drawn through the drifts by the 100-hp slusher hoists at a rope speed of 250 fpm. The loose rock soon fell out making the fingers so large that there was no control of the flow of muck. In many cases the muck completely filled the slusher drifts and the operation became dangerous and costly.




Climax standard slusher-drift layout

## Concrete Replaces Steel and Timber

Timber sets of 12 by 12 in. size were put in at the fingers in the slusher drifts but it was soon evident that larger timber was needed. Logs, 2 ft in diameter, were tried with steel wearing plates fastened to them but these timbers were soon broken and knocked out. Next steel sets were installed at the fingers. These sets were made of 14 by 14-in. box beams and were blocked into place with timber. In most cases the rock in back of the timber became loose and fell out leaving the steel sets out in the open and the rock unsupported.

Steel forms in place in a slusher drift

In the latter part of 1939 concreting of the slusher drifts was started to furnish ground support in the slusher drifts at the fingers. Since that time approximately 90,000 cu yd of concrete have been poured in the mine and as much as 2700 cu yd have been poured in one month.

Concrete work lends itself readily to substituting mechanical and electrical power for manual work if proper equipment is available and can be used. The sand and aggregate are elevated into hoppers at an outside batching plant. These materials are then weighed and dumped into the compartments of the aggregate cars. There are three of these cars here, each having 24 compartments which hold the materials for a ½ yd batch of concrete. Under the bodies of these cars are conveyor belts that dump the materials into the mixer hopper. Cement is added by hand at this point.

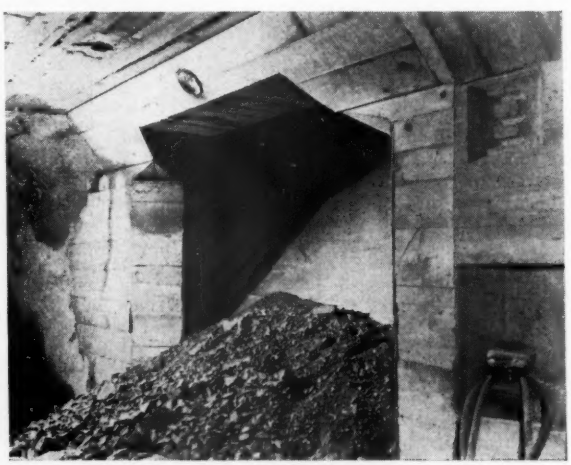
From the mixer the concrete is elevated into a Pumpcrete machine by a conveyor belt and then pumped through a 6-in. pipe line to the forms. Power for all of this equipment is taken from the 275-v, d-c trolley lines. All of this equipment is adapted for use on the 36-in. gauge track on the Phillipson level and is easily moved from one working place to another.

Wood forms were built for the first concrete work done and they were economical while the many changes were being made in the design of the slusher drifts and fingers. In 1947 steel forms were purchased for the slusher-drift concrete work and have proved to be quite satisfactory. Not only do they save time and labor but they also save much timber.

## Slusher Drifts Completely Lined

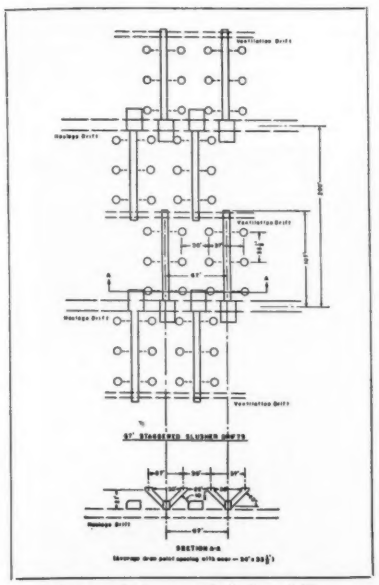
In the first slusher drifts only rings of concrete were poured at the fingers more or less as a substitute for the timber and steel sets that were for-

Concrete strengthens chutes



A concreted slusher-drift finger

merly used. As the work progressed the drifts were completely lined with concrete (see Fig. 1). Until recently the slusher drifts were 7 ft wide by 9 ft high inside of the concrete. At the present time the staggered, single-ended slusher drifts on 33½-ft centers along the haulage drifts are the same width but are 9½ ft high (see Fig. 2). These slusher drifts are driven 107 ft long and a connection is made to a



Proposed staggered slusher drifts

ventilation drift under the ends of the slusher drifts. It has been found more economical in this operation to use scrapers nearly as wide as the slusher drifts and 6-ft scrapers are used in the 7-ft drifts. The increase in height of the drifts has improved the life of the slusher cables and also permits fingers with badly worn brows to be drawn longer. The cut-outs and hoist foundations on the opposite side of the haulage drift from the slusher drifts are completely concreted with the exception of the steel discharge aprons. It has been found that steel stands up better for this purpose than anything else that has been tried.

In the original hoist cut-outs, immediately above the haulage drifts, two lean-to's were put in on either side of the steel hoppers for ventilation purposes and for storing material. In the concreted cut-outs only one lean-to on the fresh air side of the haulageway is put in. Platforms in these lean-to's were previously timbered; but now war surplus landing strip steel is installed in place of timber to reduce maintenance and improve ventilation.

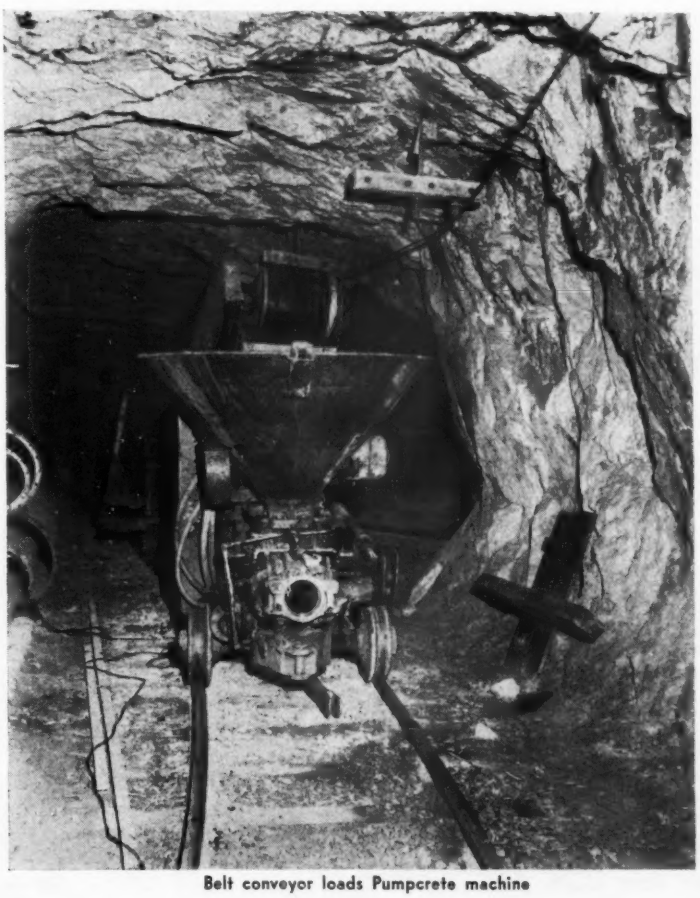
In the last, double-ended slusher drifts put in, steel hoppers made of ⅜ in. plate, 4½ ft high, 17 ft long, and 8 ft wide inside with 60 lb rail welded on the inside of the girders to protect them from the large rock, were installed directly over the haulage drifts for the discharge points into the cars. These steel girders have been replaced by concrete beams with 60 lb rail embedded in them to take the abrasion of the large rock.

The first slusher drifts were driven from the cut-outs on an incline of 10 to 15 per cent. These inclined slusher drifts presented a hazard to the men working at the fingers because of the tendency of the rock to roll down the incline. The new, single-ended slusher drifts are driven level and it is believed that they will improve draw control, ventilation, and maintenance as well as make it possible to draw from all of the fingers in the area caved at the same time without having to change the hoist from one side of the slusher drift to the other.

Rock bottoms in the first slusher drifts were badly dug up by the heavy scrapers and increased the power requirements for operating the hoists. When the first slusher drifts were completely concreted, the bottom of the drifts were also poured with eight parallel 60 lb rails running the length of the drifts but these rails were torn out quickly. More recently staggered series of parallel rails and herringbone rails with the ends bent down and embedded in the concrete, have been tried in the bottoms of the slusher drifts. The staggered series of parallel rails are much more easily installed and appear to give satisfactory service for the tonnages to be handled in an average slusher drift.

Finger design has been changed frequently and many ideas have been tried out. Originally the tapered, concreted fingers were 7 ft wide and 3½ ft high normal to the bottom. The concrete extended up the fingers 10 ft and was formed off in a vertical plane. Usually there were humps in the finger bottoms where the concrete stopped that tended to form hangups. The finger bottoms, on a 45-deg slope, started at the drift level, and the backs, on a 55-deg slope, formed a constriction at the slusher drifts. These conditions made blasting necessary throughout the fingers and the muck had little chance to start moving along the finger bottoms but banked up and choked off the fingers.

The present unconstricted fingers are driven on 33½-ft centers on both sides of the single-ended slusher drifts, directly opposite each other. They are



Belt conveyor loads Pumpcrete machine

concreted 8 ft wide, 4½ ft high and 8 ft long but the bottoms extend 5 ft beyond the vertical plane of the concreted backs to aid in eliminating hangups. The finger bottoms and backs are on a 45-deg slope and most rocks that enter the fingers go through without blasting. The finger bottoms are 18 in. above the drift bottoms at the drifts and tend to prevent banking and choking at the fingers when 6-ft scrapers are used. The finger backs are formed in an arch in an attempt to copy the natural wear. Steel of various shapes and sizes has been embedded in the concrete in the finger backs but the concussion soon loosens and knocks out this steel.

At present, slusher drifts and fingers are lined with at least 12 in. of concrete before stoping is started. The greatest wear is on the finger backs and about 5 ft of concrete is poured in this section but the amount of concrete poured here should be dependent upon the tonnage to be drawn through the finger. The average compressive strength of the concrete is approximately 4500 psi but this strength alone is not sufficient to stand the heavy blasting. For this work concrete should have resistance to abrasion and enough mass and strength within economical limits to withstand intense concussion.

Reinforcing steel was tried in the slusher drifts and fingers but was discarded as it formed a line of weakness and the concrete was broken to this line quickly by the pounding and heavy concussion. At present, reinforcing steel is used in concrete that is away from heavy concussion and where some strength in tension may be necessary.

## Success of Concrete in Slusher Drifts Indicates Extensive Application

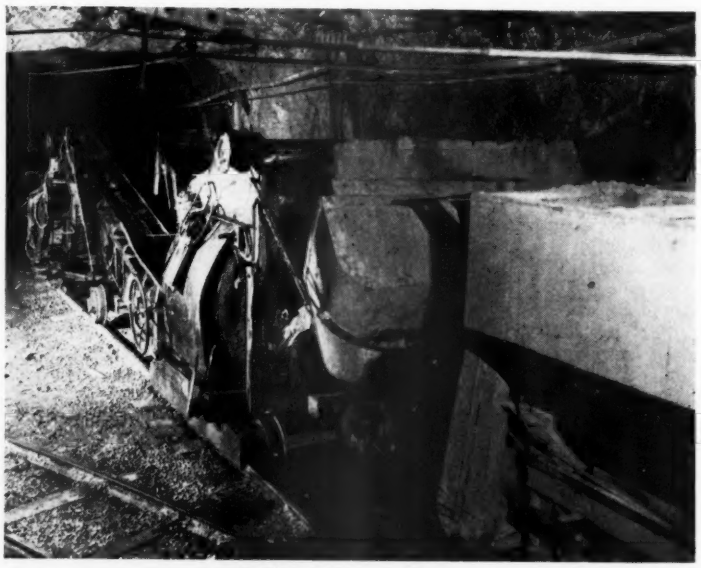
Several other uses for concrete have been found since it was first tried in the slusher drifts. Frequently the finger brows become worn out in the slusher drifts where large tonnages must be drawn. These draw points must be repaired before the remaining tonnage may be extracted but often it is difficult to get hangups that will stay long enough to complete the work. In these cases timber bulkheads are built in the fingers and concrete is pumped in to form safe hangups. When the repair work is completed this concrete is drilled and blasted out.

In ventilation work at Climax overcasts are frequently built to carry either fresh or contaminated air over some of the main haluageways. These overcasts must be fairly tight and it has been found that concrete does this work much more satisfactorily than timber and at the same time eliminates maintenance work.

At some of the more important turnouts on the haulage level where timber had been set, some maintenance work was necessary because of derailments and some blasting that was done in trimming large rocks which projected too high above the cars. In several of these places concrete has replaced the timber sets and requires no maintenance.

It was only natural that since concrete worked so well in the slusher drifts that it should be used for concreting the grizzly chamber cut-outs, and around the chutes. In the grizzly chamber cut-outs, the problem was similar to that found in the slusher drifts in that the finger brows had to be maintained to control the flow of muck. The problem at the chutes was due mostly to the fact that the repeated blasting loosened the blocking and it soon fell out. By replacing much of the timber with concrete, this maintenance problem has been largely eliminated.

Although the concrete that has been poured here has raised the costs over those which were originally anticipated, it has solved the problem of ground support in the slusher drifts nicely and the over-all costs for handling this coarse muck in the slusher drifts is less than in the chute and grizzly system.



Batch car, mixer, and conveyor

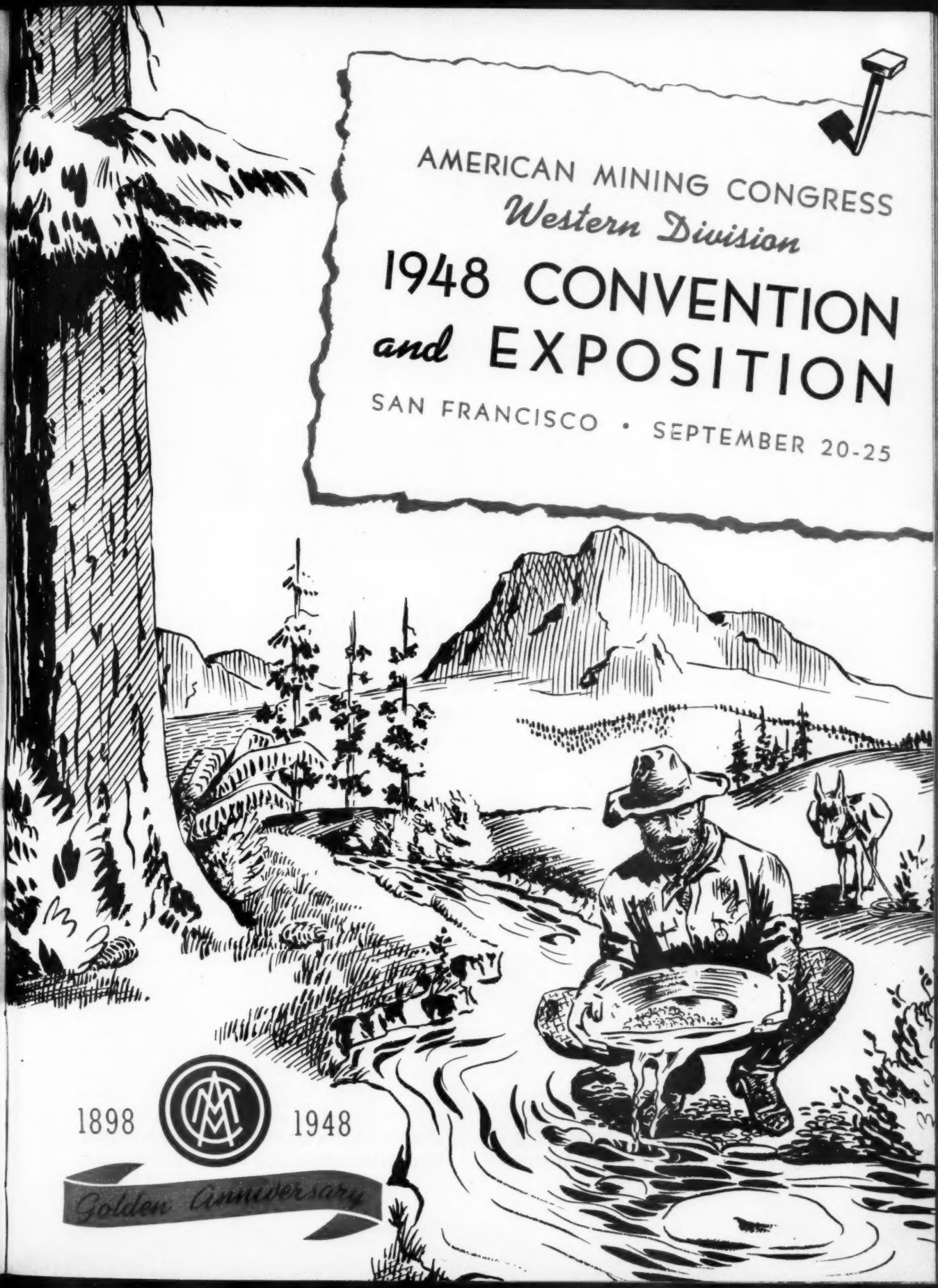
A completed slusher drift

AMERICAN MINING CONGRESS

*Western Division*

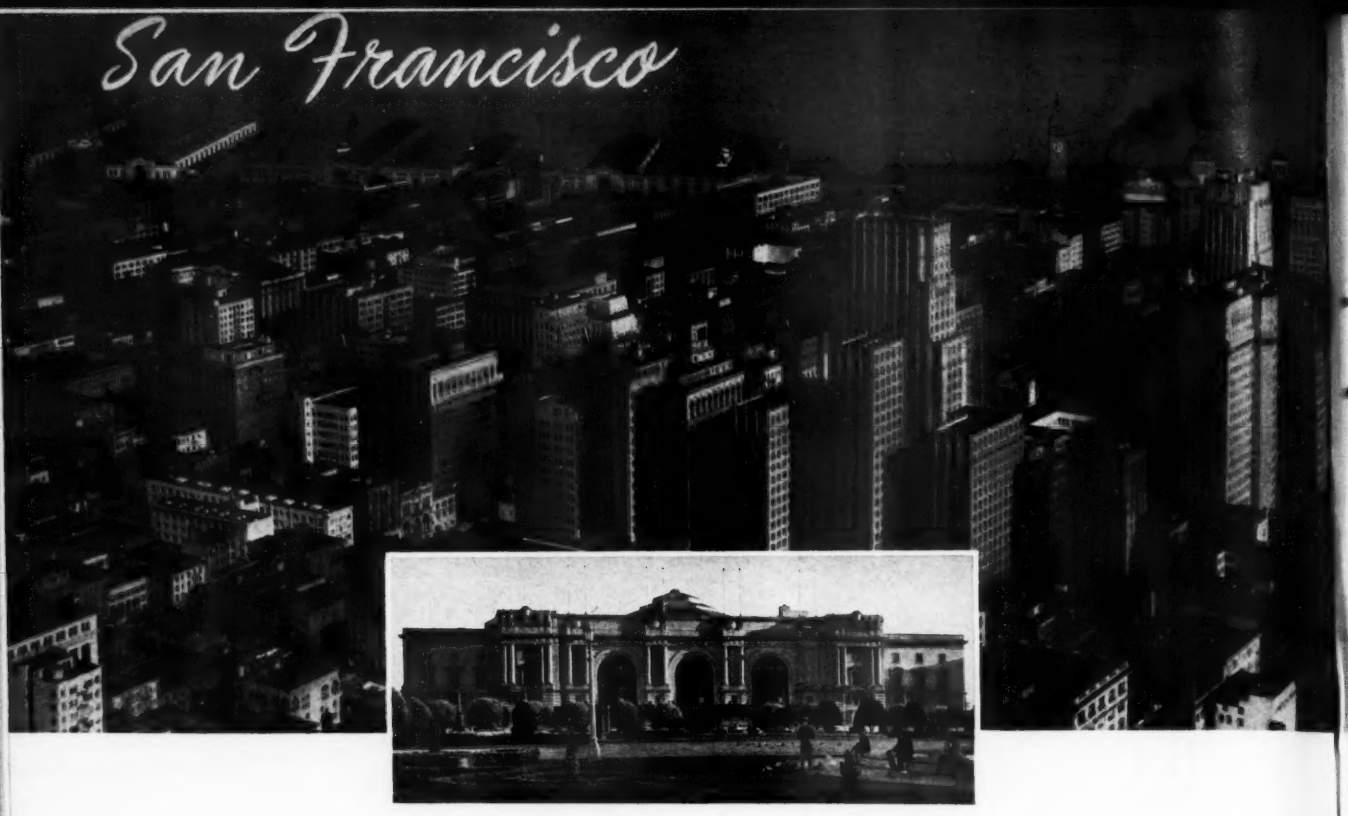
# 1948 CONVENTION *and* EXPOSITION

SAN FRANCISCO • SEPTEMBER 20-25



1898 1948

*Golden Anniversary*




# Golden Gate City Beckons Miners

**Mining Men From Every District to Study Industry Problems and Develop Constructive Future Course of Action at 1948 Convention and Exposition**

ALMOST within sight of the Golden Gate that signified such great promise to early California gold seekers, will take place the 1948 Convention and Exposition of the Western Division of the American Mining Congress. Eleven sessions, embracing almost every phase of the mining industry and allied problems, have been arranged by an active Program Committee working under the able leadership of Chairman E. S. McGlone. The events taking place in San Francisco's Civic Auditorium during the week of September 20, commemorating the 100th Anniversary of the discovery of gold in California and the 50th Anniversary of the American Mining Congress, promise to be of great significance to mining men in every branch of the metal and nonmetallic mining industry.

Session titles indicate the unusually broad scope and comprehensive coverage of industry problems. They include detailed treatment of government policies and their effect upon the mining industry; the future of gold and other metals; new milling practice developments; problems under consideration by the National Minerals Advisory Council—stockpiles, exploration and development incentives, marginal deposits, etc.; the mechanization of mining operations; labor relations and manpower problems; open-pit and placer mining; taxation, traffic matters and nonmetallic minerals;

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Ladies

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Trips

practical mine operating problems, and recent discoveries that are adding to our ore reserves.

### Latest Equipment Featured in Exposition

Eighty-eight different exhibits will display new machinery, equipment, tools, and supplies developed for service in the mining industry. The displays include a vast variety of equipment for exploration, rock drilling, blasting, transportation, and for every operation conducted in the mining and milling of ores and nonmetallic minerals. Technical representatives of the various exhibitors will be on hand to confer with operating men and to offer advice on the most efficient use of their equipment. A list of exhibitors and a description of their displays may be found beginning on page 57.

Tuesday morning September 21, and Wednesday afternoon, September 22, have been left free for examination of the exhibits. The men who are responsible for the day-to-day operation of mines and mills, in addition to company executives, will find that in the exhibits a complete picture of available equipment and new developments that, placed in use, can lead to increased efficiency and economy.

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**S. W. NORTON**
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**E. S. O'CONNOR**
*Columbia Steel Co.*

**WALTER C. PAGE**
*U. S. Smelting, Refining & Mining Co.*

**J. B. PERRY**
*Westvaco Chemical Corp.*

**JAMES K. RICHARDSON**
*Utah Mining Assn.*

**JAMES W. WADE**
*Tintic Standard Mining Co.*

## WASHINGTON

**D. I. HAYES** (Chairman)
*American Zinc, Lead & Smelting Co.*

**JOHN J. CURZON**
*Chelan Div., Howe Sound Co.*

**C. O. DUNLOP**
*Silver Dollar Mining Co.*

**FRANK EICHELBERGER**
*Spokane, Wash.*

**SHELDON L. GLOVER**
*Division of Mines & Geology, Washington Department of Conservation & Development*

**JENS JENSEN**
*Pend Oreille Mines & Metals Co.*

**ROWLAND KING**
*Manganese Div., Sunshine Mining Co.*

**FRANK LILLY**
*Prospectors & Mine Owners Assn.*

**P. E. OSCARSON**
*Morning Star Mining Co.*

**ROGER O. OSCARSON**
*Northwest Mining Assn.*

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**MILNOR ROBERTS**
*University of Washington*

**FRANK WAGNER**
*Knob Hill Mines, Inc.*

**GEORGE H. WATERMAN**
*Manufacturers Mineral Co.*

**LEWIE WILLIAMS**
*West Coast Mineral Assn.*

### MISSISSIPPI VALLEY AREA

**O. W. BILHARZ** (Chairman)
*Bilharz Mining Co.*

**J. H. BUCHANAN**
*Nellie B. Mining Co.*

**FRED CHILDRESS**
*Mahutska Mining Co.*

**EDWARD L. CLARK**
*Missouri Geological Survey & Water Resources*

**GEORGE M. FOWLER**
*Consulting Geol., Joplin, Mo.*

**HOWARD O. GRAY**
*Tri-State Zinc & Lead Ore Producers Assn.*

**ELMER ISERN**
*Eagle-Picher Mining & Smelting Co.*

**JEAN McCALLUM**
*St. Louis Smelting & Refining Works, National Lead Co.*

**B. F. MURPHY**
*St. Joseph Lead Co.*

**CHARLES A. NEAL**
*Atlas Milling Co.*

**RAYMOND F. ORR**
*Athletic Mining & Smelting Co.*

**GEORGE W. POTTER**
*Joplin, Mo.*

**NOLAN PROBST**
*Park City Consolidated Mines Co.*

**E. R. SHOREY**
*University of Wisconsin*

**J. H. STEINMESCH**
*Minerva Oil Co.*

**J. H. TREWARTHA**
*Ozark-Mahoning Co.*

**LOUIS WARE**
*International Minerals & Chemical Corp.*

### LAKE SUPERIOR DISTRICT

**CHARLES J. STAKEL** (Chairman)
*Cleveland-Cliffs Iron Co.*

**PATRICK BUTLER**
*Butler Brothers*

**F. H. CASH**
*Republic Steel Corp.*

**RUDOLPH T. ELSTAD**
*Oliver Iron Mining Co.*

**RUSSELL C. FISH**
*M. A. Hanna Co.*

**M. D. HARBAUGH**
*Lake Superior Iron Ore Assn.*

**W. A. KNOLL**
*Michigan Mines, Pickands Mather & Co.*

**ENDICOTT R. LOVELL**
*Calumet & Hecla Consolidated Copper Co.*

**C. W. NICOLSON**
*North Range Mining Co.*

**RAY D. NOLAN**
*Division of Lands & Minerals, Department of Conservation*

**HARRY S. PETERSON**
*Jones & Laughlin Ore Co.*

**J. MURRAY RIDDELL**
*Michigan College of Mining & Technology*

**R. D. SATTERLEY**
*Inland Steel Co.*

### EASTERN

**R. L. McCANN** (Chairman)
*New Jersey Zinc Co.*

**P. F. BEAUDIN**
*Copper Range Co.*

**HARLEY A. COY**
*American Zinc Co. of Tennessee*

**JAMES DOUGLAS**
*Phelps Dodge Corp.*

**R. F. GOODWIN**
*American Smelting & Refining Co.*

**JOSEPH T. HALL**
*Callahan Zinc-Lead Co., Inc.*

**EVAN JUST**
*Engineering & Mining Journal (on leave)*

**FRED D. KAY**
*American Rutile Corp.*

**FREDERICK F. KETT**
*Mining Div., Vanadium Corp.*

**RALPH E. KIRK**
*Tennessee Coal, Iron & RR Co.*

**M. H. KURYLA**
*U. S. Smelting, Refining & Mining Co.*

**JOSEPH R. LINNEY**
*Republic Steel Corp.*

**J. R. C. MANN**
*Empire Star Mines Co., Ltd.*

**H. S. McQUEEN**
*Alcoa Mining Co.*

**THOMAS G. MOORE**
*American Metal Co., Ltd.*

**JOHN F. MYERS**
*Tennessee Copper Co.*

**RUSSELL J. PARKER**
*Kennecott Copper Corp.*

**KENNETH B. RAY**
*Westvaco Chemical Corp.*

**ROBERT H. RIDGWAY**
*U. S. Vanadium Co.*

**JASPER L. STUCKEY**
*North Carolina State College*

**H. S. WEST**
*Haile Mines, Inc.*

**GLOYD M. WILES**
*National Lead Co.*

**F. E. WORMSER**
*St. Joseph Lead Co.*

### MINING EQUIPMENT MANUFACTURERS

**J. J. HUETHER** (Chairman)
*General Electric Co.*

**N. K. ANDERSON**
*Alloy Steel & Metals Co.*

**W. H. BACHMAN**
*C. S. Card Iron Works Co.*

**P. F. BAUER**
*Allis-Chalmers Manufacturing Co.*

**A. W. DALE**
*Gardner-Denver Co.*

**J. H. FULFORD**
*Jeffrey Manufacturing Co.*

**WILLIAM E. GOODMAN**
*Goodman Manufacturing Co.*

**E. M. HEUSTON**
*Bucyrus-Erie Co.*

**H. N. HOW**
*Western Machinery Co.*

**A. S. KNOIZEN**
*Joy Manufacturing Co.*

**R. D. LONGYEAR**
*E. J. Longyear Co.,*

**C. J. PERRY, JR.**
*E. I. duPont de Nemours & Co., Inc.*

**L. G. SCHRAUB**
*Union Wire Rope Corp.*

**C. B. STAINBACK**
*Westinghouse Electric Corp.*

**GEORGE E. STRINGFELLOW**
*Thomas A. Edison, Inc.*

**GILFRY WARD**
*American Manganese Steel Division*

## Well-known Authorities Take Active Part

Representatives of the Federal Government, among whom are a number of nationally-known figures, will contribute to the wealth of information the convention provides for the industry. These include U. S. Senators Pat McCarran and George W. Malone of Nevada; Representatives Richard M. Nixon and Clair Engle of California; Major General C. F. Robinson, executive officer of the National Security Resources Board; Dr. James Boyd, director, U. S. Bureau of Mines; Evan Just, director of the Strategic Materials Division of the Economic Cooperation Administration; and John K. Gustafson, director of the Division of Raw Materials, U. S. Atomic Energy Commission. Along with other outstanding persons taking an active part in the program are Howard I. Young, President of the American Mining Congress and the American Zinc, Lead and Smelting Co.; E. S. McGlone, Chairman of the Program Committee and vice-president of Anaconda Copper Mining Co.; Worthen Bradley

# President and Metal Mining Directors American Mining Congress

HOWARD I. YOUNG
President

*(Not shown)*
NEIL W. RICE

A. E. BENDELARI

WORTHEN BRADLEY

D. A. CALLAHAN

LOUIS S. CATES

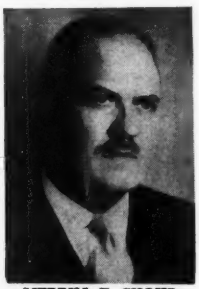
ANDREW FLETCHER

V. P. GEFFINE

JAS. R. HOBBINS

H. C. JACKSON

D. D. MOFFAT



MERRILL E. SHOUP

Chairman of the Western Division of the American Mining Congress and president of the Bradley Mining Co.; and J. H. Fulford, Vice-Chairman of the Manufacturers Division of the American Mining Congress and vice-president, Jeffrey Mfg. Co.

**Program Blankets Industry Activities**

Examination of the program reveals that every branch of the field is served by an authoritative speaker, an expert in his field, who will delve into the details of a specific problem to point the way to its solution. Amplifying the statements of the principal speakers are the discussion remarks by qualified specialists in each field, following which questions from the

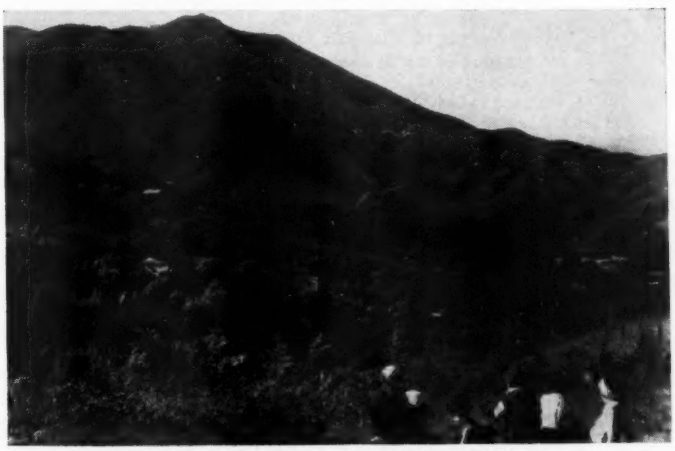
floor and further discussion will be in order. Thus operating men and executives will have every opportunity to realize the maximum value from the Convention sessions.

### Entertainment and Trips

Balancing the program sessions, a series of entertaining social functions have been planned that will provide an unexcelled opportunity to meet old friends and make new ones. Miners and their ladies are certain to derive real pleasure from these well-planned events. The welcoming luncheon on Monday, when Convention-goers will be addressed by the Hon. Clair Engle, Member of Congress from California, will be the opening event in a series of exceptionally fine social gatherings.

The Mining Jamboree, Monday evening, will be a real fun fest. Cocktails followed by a buffet supper will get the evening's entertainment off to a good start. During the intermissions, skillful professional performances will hold the tempo of the evening at a high level

**Warren Whitney, of Birmingham, distinguished after-dinner speaker and ardent advocate of our American system, will give the Convention visitors their "Seventh Inning Stretch" at the Golden Anniversary Banquet on Thursday evening.**



Majestic Mt. Tamalpais, Marion County, California

Idaho Maryland Mines Corporation's New Brunswick shaft and mill, Grass Valley

Tuesday night has been left for one's own choice of entertainment. San Francisco's numerous night spots will come in for their share of high jinks when the miners tour the city.

At the special request of many who enjoyed the boat ride of the 1941 Convention, another moonlight cruise of beautiful San Francisco Bay has been arranged for Wednesday evening. There will be a gay crowd aboard the *Sierra Nevada* to enjoy a delicious box supper, dancing, boxing matches, and other entertainment. A special feature of the evening will be a sweepstake drawing for several valuable prizes.

Climax of the Convention entertainment is the Golden Anniversary Banquet which takes place Thursday evening in the Garden Court of the Palace Hotel. Past Presidents of the American Mining Congress, Chairmen of the Western Division, and past Convention and Exposition Chairmen will be honored on this occa-

(*Cont'd page* 54)

SEN. PATRICK McCARRAN

SEN. GEO. W. MALONE

HON. RICHARD M. NIXON

HON. CLAIR ENGLE

# ★ ★ ★ PROGRAM ★ ★ ★

## *Sunday, September 19*

**1:00 p.m. to 4:00 p.m. ADVANCE REGISTRATION**
**Mining men and ladies—Palace and Fairmont Hotels**
**Exhibitors and other Manufacturers—Civic Auditorium**

## *Monday, September 20*

**8:30 a.m. REGISTRATION, Civic Auditorium**

**9:30 a.m. PRE-SESSION MOTION PICTURE—"California—Its Mineral Resources and Scenic Beauty", a World Premiere Showing. Polk Hall, Civic Auditorium**

**10:00 a.m. FIRST GENERAL SESSION—GOVERNMENT POLICIES AND THE MINING INDUSTRY**

**Opening of Convention**
JULIAN D. CONOVER, *Secretary*, American Mining Congress

Chairman: HOWARD I. YOUNG, *Pres.*, American Zinc, Lead & Smelting Co., St. Louis, *Pres.*, American Mining Congress

**Impact of the Rearmament and Industrial Mobilization Program on the Mining Industry**
MAJOR GENERAL C. F. ROBINSON, *Executive Officer, National Security Resources Board*

**Impact of the Foreign Aid Program on the Mining Industry**
EVAN JUST, *Director, Strategic Materials Division, Economic Cooperation Administration*

**Discussion of the Industry's Viewpoint on Mobilization**

**Bureaucratic Obstacles to a Prosperous Mining Industry**
P. R. BRADLEY, JR., *Pres.*, Pacific Mining Co., San Francisco

**Reciprocal Trade Agreements—Their Effect on Mining**
HON. GEORGE W. MALONE, *U. S. Senator* from Nevada

**Discussion:** CHARLES H. DUNNING, *Dir.*, Arizona Dept. of Mineral Resources, Phoenix, Ariz.

**12:30 p.m. WELCOMING LUNCHEON, Larkin Hall, Civic Auditorium**

**Presiding:** E. S. MCGLONE, *Vice-Pres.*, Anaconda Copper Mining Co., Butte, Mont.; Chairman, Program Committee

**Welcome to California**

**Responses:** HOWARD I. YOUNG, *Pres.*, American Zinc, Lead & Smelting Co., St. Louis, Mo.; President, American Mining Congress

WORTHEN BRADLEY, *Pres.*, Bradley Mining Co., San Francisco, Calif.; Chairman, Western Division, AMC

J. H. FULFORD, *Vice-Pres.*, Jeffrey Manufacturing Co., Columbus, Ohio, Vice-Chairman, Manufacturers Division, AMC

**Presentation of State Chairmen, Program Committee**

**Guest Speaker:** HON. CLAIR ENGLE, *Member of Congress* from California

**2:30 p.m. SECOND GENERAL SESSION—FUTURE OF GOLD AND OTHER METALS, Polk Hall, Civic Auditorium**

Chairman: ROBERT M. HARDY, *Pres.*, Sunshine Mining Co., Yakima, Wash.

**Outlook for Silver and the Non-Ferrous Metals**
SIMON D. STRAUSS, *Mgr. of Sales*, American Smelting & Refining Co., New York

**Status of the Strategic Metals Industries**
SAMUEL H. WILLISTON, *Vice-Pres.*, Cordero Mining Co., San Francisco

**The Outlook for Gold in an Inflationary Era**
ROBERT W. BACHELOR, *Dir. of Research Council*, The American Bankers Association, New York

**Restoring Private Ownership and an Unrestricted Market for Gold**
HON. PAT MCCARRAN, *U. S. Senator from Nevada*

**The British Empire Viewpoint on Gold**
DR. PAUL EINZIG, *Economist*, London, England

**2:30 p.m. FIRST OPERATING SESSION—ADVANCES IN MILLING PRACTICE, Second Floor Meeting Room, Civic Auditorium**

Co-chairmen: JOHN F. MYERS, *Mill Supt.*, Tennessee Copper Co., Copperhill, Tenn.
F. M. JARDINE, *Mill Supt.*, Nevada Mines Div., Kennecott Copper Corp., McGill, Nev.

**Recent Advances in Milling Practice**
W. L. ZEIGLER, *Gen. Mgr.*, Pend Oreille Mines & Metals Co., Metaline Falls, Wash.

**Symposium on Fine Grinding**
A. W. FAHRENWALD, *Dean*, School of Mines, University of Idaho, Moscow, Idaho

F. C. BOND, *Technical Dir.*, Basic Industries Research, Allis-Chalmers Mfg. Co., Milwaukee.

HOWARD M. ZOERB, *Chief Engr.*, Crusher Div., Nordberg Mfg. Co., Milwaukee

## *Tuesday, September 21*

**MORNING: OPEN—to afford ample opportunity for inspection and study of the exhibits**

**1:30 p.m. PRE-SESSION MOTION PICTURE—"The Story of Gasoline", Animated by Walt Disney. Polk Hall.**

**2:00 p.m. THIRD GENERAL SESSION—PROBLEMS UNDER CONSIDERATION BY THE NATIONAL MINERALS ADVISORY COUNCIL**

Chairman: DONALD H. MCLAUGHLIN, *Pres.*, Homestake Mining Co., San Francisco; Chairman, National Minerals Advisory Council

**Work of the National Minerals Advisory Council**
JAMES BOYD, *Director*, U. S. Bureau of Mines

**Premium Price and Subsidies . . . Marginal Deposits . . . Stockpiles . . . Exploration and Development Incentives**
Discussion led by following members of the Council's subcommittees which have been studying these subjects:

MAJ. GEN. C. F. ROBINSON

EVAN JUST

JAMES BOYD

JOHN K. GUSTAFSON

S. H. WILLISTON, *Vice-Pres.*, Cordero Mining Co., San Francisco

O. W. BILHARZ, *Pres.*, Bilharz Mining Co., Baxter Springs, Kan.

R. G. PAGE, *Pres.*, Phelps Dodge Corp., New York

E. R. LOVELL, *Pres.*, Calumet & Hecla Consolidated Copper Co., Calumet, Mich.

WORTHEN BRADLEY, *Pres.*, Bradley Mining Co., San Francisco

E. H. SNYDER, *Pres.*, Combined Metals Reduction Co., Salt Lake City

HOWARD I. YOUNG, *Pres.*, American Zinc, Lead & Smelting Co., St. Louis

**Public Lands**

CHARLES F. WILLIS, *State Secy.*, Arizona Small Mine Operators Assn., Phoenix, Ariz.; Chairman of the Council's Subcommittee on Public Lands

**Open Discussion From the Floor**

**1:15 p.m. PRE-SESSION MOTION PICTURE—"The Story of a Storage Battery." Larkin Hall.**

**1:45 p.m.—SECOND OPERATING SESSION—MECHANIZATION OF MINING OPERATIONS**

Chairman: R. J. MECHIN, *Mgr.*, Edwards Div., St. Joseph Lead Co., Balmat, N. Y.

**The Role of Mine Research in the Development of Labor-Saving Methods and Equipment**

E. R. BORCHERDT, *Chief Research Engr.*, Anaconda Copper Mining Co., Butte, Mont.

**Discussion:** D. I. HAYES, *Western Mgr.*, American Zinc, Lead & Smelting Co., Spokane

**Experience in the Use of Tungsten Carbide Insert Bits**

BLAIR BURWELL, *Pres.*, Mineral Engineering Co., Grand Junction, Colo.

**Discussion:** JOSEPH H. TAYLOR, *Vice-Pres.*, Peru Mining Co., Silver City, N. M.

WILLIAM LOACH, *Mgr.*, Wolf Tongue Mine, Boulder, Colo.

**High Speed Rock-Tunnel Driving by the Pacific Gas and Electric Co., on the Mokelumne and Feather Rivers**

H. W. HABERKORN, *Engr. of Hydroelectric Construction*, and J. E. COONEY, *Project Mgr.*, Pacific Gas & Electric Co., San Francisco

**Discussion:** A. H. BEBEE, *Vice-Pres & Gen. Mgr.*, Golden Cycle Corp., Colorado Springs, Colo.

**Underground Shaker and Conveyor Belt Operation in a Lake Superior Iron Mine**

PHILIP D. PEARSON, *Supt.* and RICHARD O. MARSTEN, *Assistant Supt.*, Inland Steel Co., Iron River, Mich.

## Wednesday, September 22

**9:30 a.m. PRE-SESSION MOTION PICTURE—"The Story of a Spark Plug." Polk Hall.**

**10:00 a.m. FOURTH GENERAL SESSION—LABOR RELATIONS—MANPOWER PROBLEMS**

Chairman: J. C. KINNEAR, *Vice-Pres.*, Kennecott Copper Corp., McGill, Nev.

**Experience under the Taft-Hartley Law—What Further Legislation Is Needed?**

HON. RICHARD M. NIXON of California; *Member, Committee on Education and Labor*, U. S. House of Representatives

**Maintaining Industrial Peace—Handling of Labor Disputes**

ALMON E. ROTH, *Pres.*, San Francisco Employer's Council

**Personnel, Safety and Public Relations Problems of the Mining Industry**

W. ERNEST JONES, *Personnel Dir.*, Climax Molybdenum Co., Climax, Colo.

**Discussion: Attracting Men to the Mining Industry—A Public Relations Problem**

BYRON E. GRANT, *Gen. Supt.*, U. S. and Lark Mines, U. S. Smelting Refining & Mining Co., Bingham Canyon, Utah

**9:30 a.m. PRE-SESSION MOTION PICTURE—"The Drama of Steel." Larkin Hall**

**10:00 a.m. THIRD OPERATING SESSION—OPEN PIT AND PLACER MINING**

Chairman: W. C. BROWNING, *Gen. Mgr.*, Golden Queen Mining Co., Los Angeles

**Factors Affecting Adoption of Open-Pit Methods at Inspiration, Ray and Bagdad, Ariz.**

A. E. MILLAR, *Pit Development Supt.*, Inspiration Consolidated Copper Co., Inspiration, Ariz.

**Discussion:** W. H. GOODRICH, *Gen. Mgr.*, Chino Mines Div., Kennecott Copper Corp., Hurley, N. M.

**Large-Scale Stripping With Dragline-Conveyor Belt Combination**

EARL S. MOLLARD, *Mgr. of Mines*, Butler Brothers, Cooley, Minn.

**Gold Dredging Practices and Problems**

H. A. SAWIN, Yuba Consolidated Gold Fields, San Francisco

**Discussion:** R. P. PORTER, *Pres.*, Porter Brothers Corp., Spokane

**12:30 p.m. LUNCHEON CONFERENCE**

Tax Committee, Strategic Minerals Committee, and others that may be arranged.

**AFTERNOON: OPEN—to afford ample opportunity for inspection and study of the exhibits**

## Thursday, September 23

**9:30 a.m. PRE-SESSION MOTION PICTURE—"Zinc—Mining, Milling and Smelting." Polk Hall.**

**10:00 a.m. FIFTH GENERAL SESSION—TAX—TRAFFIC—NONMETALLIC MINERALS**

Co-Chairmen: HENRY B. FERNALD, *Chairman*, AMC Tax Committee

LOUIS WARE, *Pres.*, International Minerals & Chemical Corp., Chicago

**Symposium on Tax Problems of the Mining Industry**

**The General Outlook for Taxes**

ELLSWORTH C. ALVORD, *Tax Counsel*, American Mining Congress

(*Continued on page* 55)

# Manufacturers

*Allis-Chalmers Mfg. Co.
Alloy Steel & Metals Co.
*American Brake Shoe & Foundry Co.
American Manganese Steel Div.
American Brattice Cloth Corp.
*American Car & Foundry Co.
American Chain & Cable Co.
*American Cyanamid Co., Explosives Dept.
American Mine Door Co.
Anaconda Wire & Cable Co.
*Atlas Powder Co.

Baker-Raulang Co.
Barber-Greene Co.
Bixby-Zimmer Engineering Co.
Bowdil Co.
Broderick & Bascom Rope Co.
*Brown-Fayro Co.
Bucyrus-Erie Co.

Cambridge Machine & Supply Co.
Card Iron Works Co., C. S.
Cardox Corp.
*Central Frog & Switch Co.
Central Mine Equipment Co.
Centrifugal & Mechanical Industries, Inc.
Chicago Pneumatic Tool Co.
Cincinnati Mine Machinery Co.
Cities Service Oil Co.
Clarkson Mfg. Co.
Colorado Iron Works Co.

D-A Lubricant Co., Inc.
Deister Concentrator Co.
Differential Steel Car Co.
Duff-Norton Mfg. Co.
*Du Pont de Nemours & Co., Inc., E. I.

*Edison, Inc., Thomas A.
Eimco Corp.

* Charter Members.

Electric Storage Battery Co.
*Elreco Corp.
Ensign Electric & Mfg. Co.
*Enterprise Wheel & Car Corp.
Euclid Road Machinery Co.

Fairmont Machinery Co.
Firestone Tire & Rubber Co.
Flood City Brass & Electric Co.

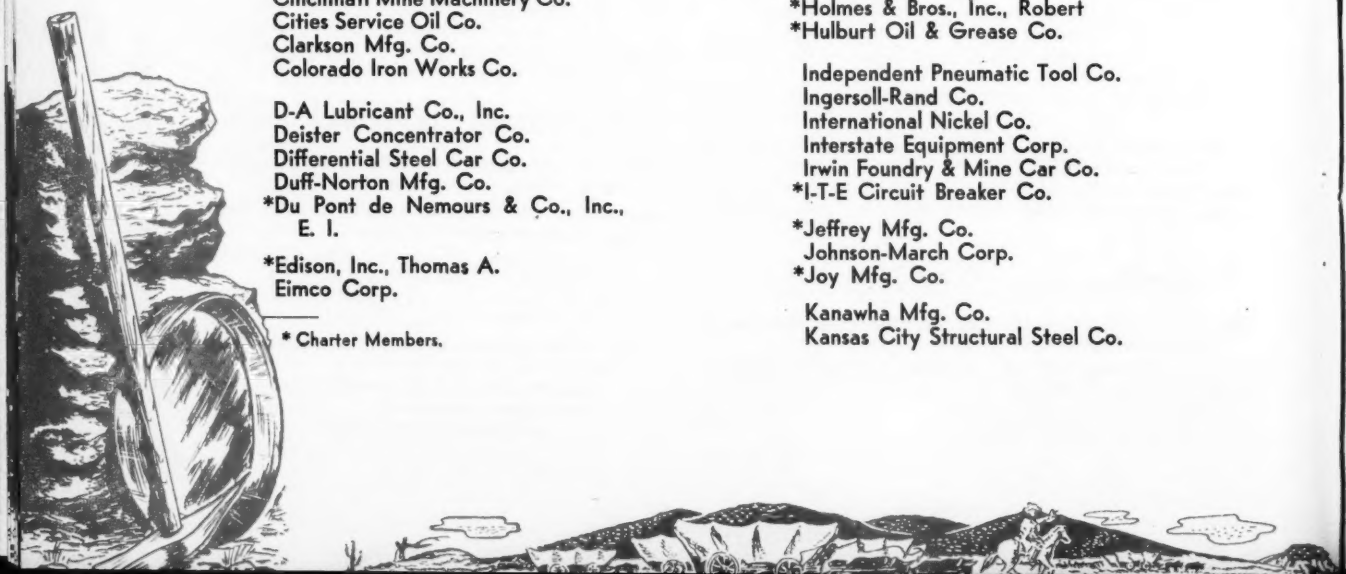
Gardner-Denver Co.
*General Electric Co.
*Goodman Mfg. Co.
Goodrich Co., B. F.
Goodyear Tire & Rubber Co.
Gorman-Rupp Co.
Gould Storage Battery Corp.
Great Western Div., Dow Chemical Co.
Gruendler Crusher & Pulverizer Co.
Guyan Machinery Co.

Harnischfeger Corp.
Hazard Insulated Wire Works Div. of The Okonite Co.
Helmick Foundry-Machine Co.
*Hendrick Mfg. Co.
*Hercules Powder Co.
Hewitt-Robins Incorporated
*Hockensmith Corp.
*Holmes & Bros., Inc., Robert
*Hulburt Oil & Grease Co.

Independent Pneumatic Tool Co.
Ingersoll-Rand Co.
International Nickel Co.
Interstate Equipment Corp.
Irwin Foundry & Mine Car Co.
*I-T-E Circuit Breaker Co.

*Jeffrey Mfg. Co.
Johnson-March Corp.
*Joy Mfg. Co.

Kanawha Mfg. Co.
Kansas City Structural Steel Co.



# DIVISION

# The AMERICAN MINING CONGRESS

Kensington Steel Co.
Koehler Mfg. Co.

LaBour Co., Inc.
Lee-Norse Co.
LeRoi Co., Cleveland Division
*Leschen & Sons Rope Co., A.
*Link-Belt Co.
Longyear Co., E. J.

*McGraw-Hill Publishing Co.
McLanahan & Stone Corp.
*McNally-Pittsburg Mfg. Corp.
Mack-International Motor Truck Corp.
Macwhyte Co.
Marion Power Shovel Co.
Mechanization, Inc.
Metal & Thermit Corp.
*Mine Safety Appliances Co.
Mines Equipment Co.
Mine & Smelter Supply Co.
Mosebach Electric & Supply Co.
Mott Core Drilling Co.
*Myers-Whaley Co.

National Electric Coil Co.
National Malleable & Steel Castings Co.
National Mine Service Co.
Nordberg Mfg. Co.

*Ohio Brass Co.
Ohio Oil Co.
Oliver Iron & Steel Corp.
Owens-Corning Fiberglas Corp.

Pacific Foundry Co., Ltd.
Paris Mfg. Co.
Penn Machine Co.
Pennsylvania Electric Coil Corp.
*Phillips Mine & Mill Supply Co.
Pittsburgh Gear & Machine Co.
Portable Products Corp.
Post-Glover Electric Co.
Precision Chain Co.
Productive Equipment Corp.
Prox Co., Inc., Frank

Quaker Rubber Corp.

Reliance Electric & Engrg. Co.
*Roberts & Schaefer Co.
*Roebling's Sons Co., John A.
Rome Cable Corp.

Safety First Supply Co.
Salem Tool Co.
Sauerman Bros., Inc.
Sheffield Steel Corp.
*Simplex Wire & Cable Co.
Simplicity Engineering Co.
*S K F Industries, Inc.
Stearns-Roger Mfg. Co.
Stephens-Adamson Mfg. Co.
Sterling Steel Casting Co.

Tamping Bag Co.
Templeton, Kenly & Co.
Texas Co.
*Timken Roller Bearing Co.
Tool Steel Gear & Pinion Co.
Traylor Engineering & Mfg. Co.
*Tyler Co., W. S.

Ultra-Violet Products, Inc.
Union Wire Rope Corp.
*United Engineers & Constructors, Inc.
U. S. Rubber Co., Wire Division
*U. S. Steel Corp., Subsidiaries

*Vulcan Iron Works Co.

Wedge Wire Corp.
*Weir Kilby Corp.
Western Machinery Co.
*Westinghouse Electric Corp.
West Virginia Steel & Mfg. Co.
Worthington Pump & Machinery Corp.

* Charter Members.

sion Worthen Bradley, President of the California Chapter and Chairman of the Western Division of the American Mining Congress, will serve as toastmaster, Warren Whitney, vice-president, James B. Clow & Sons, will deliver an address on Americanism in his inimitable manner. Later, two orchestras will provide fine music for dancing and a real floor show will give added spark to the pleasure of an evening that will be long remembered.

The ladies are invited to all Convention functions and, in addition, two special "Ladies Only" trips have been arranged. On Tuesday, September 21, an outing to Muir Woods across the Golden Gate Bridge, through the giant California redwoods, will be followed by a drive through the scenic spots of Marin County.

A luncheon trip will delight the ladies on Wednesday when they drive across the San Francisco-Oakland Bay Bridge to the Claremont Country Club.

On the heels of the week's intense activity will be the opportunity to take one of the fine trips that have been arranged. Five trips, all leaving San Francisco Friday, September 24, will provide maximum coverage of points of specific interest.

Trip No. 1 is a two-day trip to the Yuba dredge fields and the Idaho-Maryland gold mine. The dredge at Hammonton is the world's largest and several hours of the first afternoon may be spent in giving it a thorough inspection.

After an overnight stop at Grass Valley or Nevada City, the group on this trip will visit the Idaho-Maryland mine where ample time

# WESTERN DIVISION

## THE AMERICAN MINING CONGRESS

WORTHEN BRADLEY, Chairman
Pres., Bradley Mining Co.

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ROY A. HARDY, Consulting Engr. in Charge, Getchell Mine, Inc.

G. T. HARLEY, Gen. Mgr., Potash Div., International Minerals & Chemical Corp.

D. I. HAYES, Western Mgr., American Zinc, Lead & Smelting Co.

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E. McL. TITTMAN, Mgr., Southwestern Dept., American Smelting & Refining Co.

CARL J. TRAUERMAN, Secy., Mining Assn. of Montana.

H. E. TREICHLER, Gen. Mgr., Texas Gulf Sulphur Co.

F. C. VAN DEINSE, Vice-Pres. & Gen. Mgr., Yuba Consolidated Gold Fields.

FRANK WAGNER, Gen. Supt., Knob Hill Mines, Inc.

GEORGE A. WARNER, Gen. Mgr., Zuni Milling Co.

GEORGE H. WATERMAN, Pres., Manufacturers Mineral Co.

CHARLES F. WILLIS, State Secy., Arizona Small Mine Operators Assn.

S. H. WILLISTON, Vice Pres., Cordero Mining Co.

RICHARD A. YOUNG, Vice-Pres., American Zinc Co. of Illinois.

# PROGRAM (*Continued from page 51*)

**Administrative Amendments Needed**

ARTHUR H. KENT, *Atty.-at-Law*, San Francisco

**Removing Tax Deterrents to Mining Investment, Exploration and Development**

STANLY A. EASTON, *Pres.*, Bunker Hill & Sullivan Mng. & Conc. Co., Kellogg, Idaho

H. C. JACKSON, *Partner*, Pickands Mather & Co., Cleveland

B. T. POXSON, *Chr.*, Emperius Mining Co., Creede, Colo.; *Pres.*, Colorado Mining Assn.

HARVEY S. MUDD, *Pres.*, Cyprus Mines Corp., Los Angeles

**Traffic Problems of the Mining Industry**

OSCAR W. TUCKWOOD, *Gen. Traffic Mgr.*, American Smelting & Refining Co., New York

**Nonmetallic Minerals of the West**

HENRY MULRYAN, *Exec. Vice-Pres. and Gen. Mgr.*, Sierra Talc & Clay Co., Los Angeles

**9:30 a.m. PRE-SESSION MOTION PICTURE—"The Story of Tinplate." Premiere Showing. Larkin Hall.**

**10:00 a.m. FOURTH OPERATING SESSION—MINE OPERATING PROBLEMS**

Chairman: WILLIAM J. COULTER, *Gen. Mgr.*, Climax Molybdenum Co., Denver, Colo.

**Development and Sampling Procedure and Block Caving Tests in the Greater Butte Project**

CHESTER H. STEELE, *Mines Geol.*, Anaconda Copper Mining Co., Butte, Mont.

**Discussion:** CHARLES E. SCHWAB, *Mng. Engr.*, Bunker Hill & Sullivan Mng. & Conc. Co., Kellogg, Idaho

**Shaft-Sinking in the Coeur d'Alene District**

RALPH NEYMAN, *Mine Supt.*, Hecla Mining Co., Wallace, Idaho, and R. W. LOTTRIDGE, *Gen. Supt.*, Federal Mining & Smelting Co., Wallace, Idaho

**Discussion:** CLARK L. WILSON, *Mine Supt.*, New Park Mining Co., Keetley, Utah

J. MURRAY RIDDELL, *Head, Dept. of Engineering*, Michigan College of Mining & Technology, Houghton, Mich.

**Development and Mining of the San Manuel Orebody**

WESLEY P. GOSS, *Gen. Mgr.*, Magma Copper Co., Superior, Ariz.

**1:30 p.m. PRE-SESSION MOTION PICTURE—"This is Aluminum." Polk Hall.**

**2:00 p.m. SIXTH GENERAL SESSION—ADDING TO ORE RESERVES**

Chairman: IRA B. JORALEMON, *Consulting Engr.*, San Francisco

**Results of Recent Exploration and Development in Adding to Ore Reserves**

**Northwest:**

CARLTON D. HULIN, *Consulting Geol.*, Berkeley, Calif.

**Southwest:**

E. N. PENNEBAKER, *Consulting Geol.*, Consolidated Coppermines Corp., Globe, Ariz.

**Intermountain:**

RICHARD N. HUNT, *Chief Geol.*, U. S. Smelting Refining & Mining Co., Salt Lake City

**Mississippi Valley and Eastern:**

FRANK CAMERON, *Vice-Pres.*, St. Joseph Lead Co., New York

**Western Hemisphere Iron Ore:**

GROVER J. HOLT, *Chief Engr.*, Cleveland-Cliffs Iron Co., Ishpeming, Mich.

**Cooperative Programs of Geologic Mapping**

OLAF JENKINS, *Head*, California State Division of Mines, San Francisco

**Atomic Energy Minerals—Prospecting—Production—Governmental Policies**

JOHN K. GUSTAFSON, *Dir., Division of Raw Materials*, U. S. Atomic Energy Commission

**Report of Resolutions Committee**

**1:30 p.m. PRE-SESSION MOTION PICTURE—"Magnesium—Metal from the Sea." Larkin Hall.**

**2:00 p.m. FIFTH OPERATING SESSION—ADVANCES IN MILLING PRACTICE (continued)**

Co-Chairmen: JOHN F. MYERS and F. M. JARDINE

**Instrumentation and Automatic Control of Milling Plants**

I. M. LEBARON, *Supervisor of Phosphate Research*, International Minerals & Chemical Corp., Mulberry, Fla.

**Discussion:** C. M. MARQUARDT, *Electronic Engr.*, Combined Metals Reduction Co., Salt Lake City

R. E. BYLER, *Vice-Pres.*, The Merrill Co., San Francisco

**7:30 p.m. GOLDEN ANNIVERSARY BANQUET—Garden Court, Palace Hotel**

**Toastmaster:**

WORTHEN BRADLEY, *Pres.*, Bradley Mining Co., San Francisco; Pres., California Chapter, and Chairman, Western Division, American Mining Congress

**Presenting:** Past Presidents of the American Mining Congress; Past Chairmen of the Western Division; Past Convention and Exposition Chairmen

**Address: "The Seventh Inning Stretch"**

WARREN WHITNEY, *Vice-Pres.*, James B. Clow & Sons, Birmingham

Special Floor Show and Dancing

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will be allowed for a complete visit. Digging clothes will be required by those who wish to go underground. In the afternoon the return trip to San Francisco will be made through historic mining country via Auburn and Sacramento.

Trip No. 2 will cover the Yuba dredge at Hammonton on the first day and the group will bed down at Oroville. On Saturday, the second day of the trip, the party will visit the Pacific Gas and Electric Co.'s operations at its Feather River water-power development project. Those equipped with digging clothes will be able to visit the working faces of the tunnel where enviable driving records are being made. After a lunch at one of the tunnel camps, the party will return to San Francisco via Sacramento.

Trip No. 3, routed through the historic Mother Lode country, will take the travelers to

JULIAN D. CONOVER
Secretary
American Mining Congress

Sonora, Columbia, Carson Hill, Angels Camp, San Andreas, Mokelumne Hill, and Jackson, once scenes of feverish activity in the early California search for gold. The party will spend the night at the comfortable old inn at Volcano.

On Saturday, the second day, Sutter's Creek, the Central Eureka mill, Placerville, and many other points of interest will be visited. Gold dredging operations at the Folsom field will be inspected in the afternoon and the party will return to San Francisco via Sacramento.

Two one-day trips are planned for Friday, September 24. One will go to the Folsom field by way of the Bay Bridge, Oakland, Vallejo, and Sacramento, allowing the entire afternoon for inspection of the gold-dredging operations. The other will cover the heavy industry area of Upper San Francisco Bay around Pittsburg. Visits will be made to the large steel mill of the Columbia Steel Co., Dow Chemical's electro-chemical plant, the Shell Development Co.'s works, and other industrial plants of interest to mining men.

Improved mining and milling methods and constructive policy on all industry questions are of greater importance than ever before, as an unprecedented demand for minerals and metals urges peak production upon the industry. The comprehensive program of the 1948 Convention and Exposition of the Western Mining Congress is a beacon illuminating these problems for mining men as they keep the muck rolling.

## *Members of American Mining Congress Staff*

A. W. DICKINSON

P. D. McMURRER

H. L. MOFFETT

SHELDON P. WIMPFEN

Gold dredge at work in the Sacramento Valley

# Exposition

SEE the keys that will unlock your operating problems in the 87 exhibits of mining equipment at the San Francisco Convention and Exposition. The 1948 Exposition will be the most comprehensive display of up-to-date machines, tools, devices, and materials for metal and non-metallic mining that has ever been shown. Trained representatives of the manufacturers will be on hand to consult with mining men on their proper application.

Greater economy, efficiency, and safety in mineral production can be achieved through the study and use of the multitude of items on display. Here is a preview of the equipment that will make the mining industry click.

**J. J. HUETHER**
Manager, Transportation Division
General Electric Co.
Chairman, Manufacturers Div., AMC

**J. H. FULFORD**
Jeffrey Mfg. Co.
First Vice-Chairman

**M. L. McCORMACK**
Ingersoll-Rand Co.
Second Vice-Chairman

**JOHN T. RYAN, JR.**
Mine Safety Appliances Co.
Third Vice-Chairman

• **ALLIS-CHALMERS MFG. CO.**

An operating model of the Type "R" reduction crusher with automatic reset will be on display along with a quarter-scale model of the company's CW solids pump. Photographic enlargements of Allis-Chalmers mine hoist, rod mill, A-L jaw crusher, centrifugal pumps, and Texrope products will constitute a part of the background display.

• **ALLOY STEEL AND METALS CO.**

Will feature one Pacific jaw crusher equipped with a Pacific feeder and grizzly. In addition several models of Pacific drag scrapers of a new design will be exhibited with a group of photographs showing various scrapers in actual mining operations. The new bolted Model HA-42-in. scraper will also be exhibited. A complete line of manganese steel Timken bearing equipped Pacific sheave blocks will be shown along with a manganese steel tail block and different sizes of sheave anchors. *In charge—J. M. McKean.*

• **AMERICAN AIR FILTER CO., INC.**

Will have a display featuring operating and inoperative dust-control and air-cleaning equipment particularly adaptable to the mining industry. A precipitator with automatic slug ejector and an oil-bath air cleaner for engine and compressor application will be on hand. Models on display will be either cutaway, full-scale, or operating models with visual inspection facilities. *In charge—Robert H. Walpole, Jr.*

• **AMERICAN BRATTICE CLOTH CORP.**

Will display the company's two main products: ABC brattice cloth and Mine Vent flexible tubing. A small blower fan and tubing hook-up will demonstrate Mine Vent in miniature. Samples and information on the new vinyl plastic coated Mine Vent tubing will be available. *In charge—D. Blaine Mikesell.*

• **AMERICAN MANGANESE STEEL DIVISION**
**(American Brake Shoe Co.)**

A model of the renewable lip dipper produced by the company, a 3-in. industrial pump, an alloy ball-mill grate, and three ball-mill liners will be exhibited. In addition, various types of manganese steel and hard-surface welding rods will be on display. *In charge—Gilfry Ward.*

• **ANACONDA WIRE & CABLE CO.**

Description not available.

• **APACHE POWDER CO.**

A background of panorama photographs of the development of the Morenci Pit of the Phelps Dodge Corp. from 1941 to date, together with pictures of large blasts made at Castle Dome and other big copper operations will be included with pictures of standard powders, blasting caps, and blasting accessories. Floor space of the booth will be reserved as a smoking and lounging room for the use of those attending the convention. *In charge—R. L. Dimmick.*

• **ATLAS POWDER CO.**

Will feature photographs and scale models illustrating the advantages of the Rockmaster milli-second delay blasting system. Safety features of Atlas Manasite blasting caps will be brought out in the exhibit. *In charge—John Swenehart.*

• **BARBER-GREENE CO.**

A series of photographic murals and a selection of kodachromes showing the company's material-handling machines in use by the metal mining industry will be on display. *In charge—J. D. Turner.*

• **BETHLEHEM PACIFIC COAST STEEL CORP.**

Bethlehem mining ropes, hollow drill steel, mine cars, and mine trackwork will be exhibited. *In charge—W. S. Briscoe.*

• **BUCYRUS-ERIE CO.**

The display will consist chiefly of photographs of shovels, draglines, tractor equipment, and blast-hole drills used in open-pit mining operations. *In charge—J. H. Sackett.*

• **E. D. BULLARD CO.**

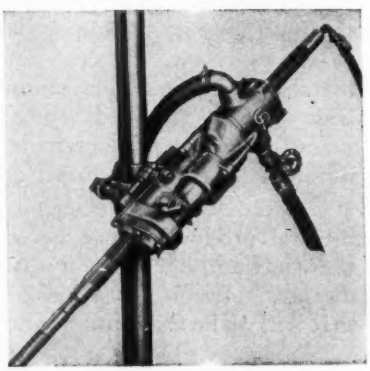
A completely new Bullard hard boiled hat will be unveiled at the 1948 Convention and Exposition. Sharing the spotlight in the Bullard booth will be the complete line of Wilson respirators, protection products, gas masks, and eye as well as hoods, helmets, purifiers, and various other Bullard products. *In charge — Alpheus Bull.*

• **C. S. CARD IRON WORKS CO., THE**

Replicas of a number of different types of mine cars of various designs and capacities will be on display. *In charge—D. C. Card.*

• **CHICAGO PNEUMATIC TOOL CO.**

A complete representation of all the mining equipment produced by the company will be shown including new tools which have recently been added to the line of products. A heavy demolition tool and two new sinker drills will be introduced. In addition a standard motor drifter, rotor drifter, diamond drills, and other equipment will be shown. A brand new diamond drill called the CP-55 will be the high point of the exhibit. This new drill has a rotary air motor which weighs no more than that used in the well-known CP-5 but is much more powerful. *In charge—Van Cunningham.*



• **COAST MANUFACTURING & SUPPLY CO.**

Plans call for a model of a drift round showing the application of Spittercord safety fuse in lighting and timing various fuse lengths. Samples of safety fuse and Primacord detonating fuse, with literature on these various products will be available. *In charge—F. W. Nelson.*

• **COFFING HOIST CO.**

Two models of the combination hoist-jack and the quarter-ton Mighty Midget Puller will be on display. *In charge—J. R. Coffing.*

• **COLORADO FUEL AND IRON CORP., THE**

Plans an exhibit including Wickwire rope, Calwico-Wissco industrial screens, grinding balls and rods, mine rails and fastenings. The exhibit will be built of Philippine mahogany with back panels and a large case containing an animated display. *In charge—John T. Brittain.*

• **COLUMBIA STEEL CASTING CO., INC.**

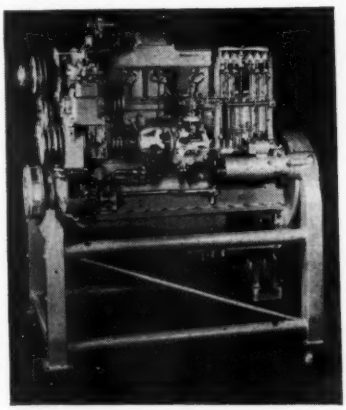
Description not available.

• **CRUCIBLE STEEL CO. OF AMERICA**

Will welcome visitors to participate in an estimating contest. *In charge—H. G. Bain.*

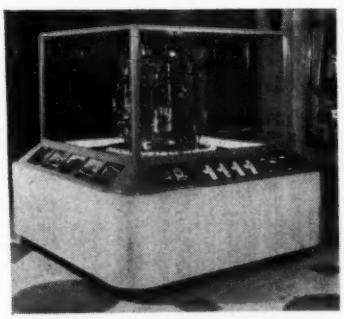
• **CUMMINS ENGINE CO., INC.**

Will display an activated cutaway version of the Cummins Diesel. This engine has been sectionalized to show clearly the internal structure and operation of the Cummins fuel system, cylinders and liners, valves, pistons, supercharger and drive, gear train, water pump, oil cooler, lubricating oil pump, and the oil pan. These sectionalized portions of the engine have been replaced with lucite and the engine is internally lighted to set off its mode of operation clearly.



• **DETROIT DIESEL ENGINE DIVISION, GENERAL MOTORS CORP.**

A glass-enclosed, three-cylinder, cutaway, two-cycle Diesel engine will be exhibited. All parts of the engine move as in actual operation. The cutaway engine will be so mounted that spectators may view both ends and both sides of the engine while standing in one spot. *In charge — E. F. Bentley* and *D. R. McIntyre.*



• **E. I. DU PONT DE NEMOURS & CO., INC.**

A variety of Du Pont products including the millisecond fast delay electric blasting caps, the "Series B" delay electric blasting caps, "Gelex" dynamite and "Extra" dynamite will be featured. *In charge—S. M. Strohecker, Jr.*

• **THOMAS A. EDISON, INC.**

Will display a 90-cell, nickel-iron-alkaline, mine-locomotive battery. Several cells of the type commonly used to power mine-haulage equipment will be on hand. One of these cells will be cut away to reveal the internal steel construction. Another unit of the exhibit will show pure nickel flake used in the construction of the positive tubes of Edison cells. One of these cells will be cut away and placed under a magnifying lens to show how the nickel is used to increase conductivity. An interesting sidelight will be one of the original telephone instruments manufactured by Thomas A. Edison and Associates for use on the first long distance telephone line in the world. This line, installed by the Ridge Telephone Co. of San Francisco in 1878, extended from French Corral in Nevada County to Milton in Sierra County—a distance of 60 miles. *In charge —R. H. Weeks, Jr.*

• **EIMCO CORP., THE**

Will exhibit three models of rocker shovels used in mining and tunnel operations and a folding scraper. *In charge—D. W. Saunders.*

• **ELECTRIC STEEL FOUNDRY CO.**

Will exhibit stainless and alloy steel products used for the mining industry, including valves, pipe, pipe fittings, impellers, pump parts, liners, jaws, and other wearing parts of grinding and crushing equipment.

• **ELECTRIC STORAGE BATTERY CO., THE**

Background display will feature a composite view of the company's factories and assembly plants located throughout the country. Cutaway cells of the well-known Exide-Ironclad batteries especially designed for motive power service will be shown in several sizes. *In charge—Thomas H. Dooling.*

• **ENGINEERING AND MINING JOURNAL**

Copies of the magazine will be on hand and ample space will be provided for Convention goers. *In charge—H. R. Mathias* and *R. W. Davis.*

• **EUCLID ROAD MACHINERY CO., THE**

A model 49FD rear-dump Euclid and a cutaway model of the drive axle will be on display. *In charge—A. E. Sorensen.*

• **FAIRCHILD AERIAL SURVEYS, INC.**

Samples of photographic and topographic maps showing how they aid the mining industry will be on display. Various types of stereoscopes and also an automatic heliotrope used in establishing major triangulation in any area where controls are necessary will also be exhibited. *In charge—W. L. Cozzens.*

• **FIRTH STERLING STEEL & CARBIDE CORP.**

Plans a display of under-cutter coal bits, a variety of percussion rock bits, and oil and gas drilling bits.

• **FLEXIBLE STEEL LACING CO.**

Two new products, the hinged belt fasteners, and wide belt cutter produced by the company will be exhibited. *In charge—H. J. Beach.*

• **GALIGHER CO., THE**

The Agitair flotation machine, Geary-Jennings samplers, laboratory equipment, and Geary feeders will be featured. This equipment will be in operation and certain sections will be removable to allow study of the equipment while it is operating. *In charge—John T. Potts.*

• **GARDNER-DENVER CO.**

Plans to exhibit four different models of hand-held sinker drills, two self-rotating stopers, and three current models of automatic-feed drifting drills. A new CM motor chain feed available for 6, 8, and 10-ft steel changes will be on display. A model GD14 mine-car loader and a model DS6 drill sharpener will be in the exhibit. A single-drum air hoist and HMS shaft-mucking hoist of the type used in connection with clam-shell buckets for shaft-sinking rigs will be included. A variety of other equipment including air motors, pumps, paving brakers will be shown.

• GATES RUBBER CO., THE

An electronic display will be featured to demonstrate, through the use of the oscillograph, the various properties of Gates Vulco Ropes. This unit comprises a compressor driven by an electric motor. An animated panel will demonstrate various properties of Gates Vulco Ropes and a slide projector will show what specialized research means to the mine users of Gates products. *In charge—Jack Pilcher.*

• GENERAL ELECTRIC CO.

A tri-Clad motor completely encased in a transparent plastic frame will be one of the features of the exhibit. In the motor line will be shown a large, self-ventilated, mill-

type motor and a brush-shifting, variable speed, alternating-current motor, known as the new Type ACA.

A complete assortment of G-E cable will include types used in underground mining operations and in such above-ground applications as open-pit mining, smelting, and refining. A new G-E motor control center will be set up for visitors to examine.

A novelty feature of the exhibit will be a shooting gallery where visitors will be given 15 shots with which to light up the ten segments of a production and engineering service graph. *In charge—R. D. Ketner* and *G. A. ReQua.*

• GOODMAN MANUFACTURING CO.

Will exhibit a Mancha "Little Trammer" and two of its bigger brothers—Mancha Mules. Two of these locomotives will be operative. The other will have the battery box removed for the convenience of detailed inspection. Half of the display space will be taken up by a combination of shaker-conveyor and belt-conveyor equipment handling a metallic ore in a closed circuit. The ore-conveying equipment will be so set up as to permit detailed examination of the equipment. *In charge—J. D. James.*

• GOULD STORAGE BATTERY CORP.

Gould "Thirty" and "Kathanode" storage batteries for mine locomotives and shuttle cars will be featured. Cutaway cells and exploded-view drawings will point out construction features of the Gould "Thirty" line of batteries. Glass tape insulation will also be on display. A radio-phonograph combination will be awarded to the convention registrant who most closely estimates the number of feet of glass tape in a Gould "Thirty" mine locomotive battery. *In charge—J. A. Gilruth.*

• GREAT WESTERN DIVISION THE DOW CHEMICAL CO.

Flotation reagents produced by the company will be featured in the exhibit. *In charge—J. C. Lokken.*

• HARDINGE CO., THE

A small-scale model of the Hardinge conical mill built of glass to show the action inside will be exhibited. This mill will actually control, through electronic sound devices, an automatic feeder on the other side of the booth whose speed will increase or decrease depending upon the conditions within the mill. This electronic device which controls the feeder is the Hardinge "electric ear." A battery of lighted transparencies as well as a large animated panel showing the action of the Hardinge Thermomill will make up the background of the booth. *In charge—G. A. Wallerstedt.*

• HARNISCHFEGER CORP.

A working model will demonstrate "Magnetron" control along with the "Magnetorque." *In charge—P. H. Hunter.*

• HERCULES POWDER CO.

Description not available.

• E. F. HOUGHTON & CO.

Industrial oils and mechanical packings will be featured. Demonstrations will be made with a solvent added to fuel oil to dissolve sludge in industrial heating systems. Leather and synthetic rubber packings used in the mining industry will be on display. *In charge—W. A. Fletcher.*

• HUMPHREYS INVESTMENT CO., THE

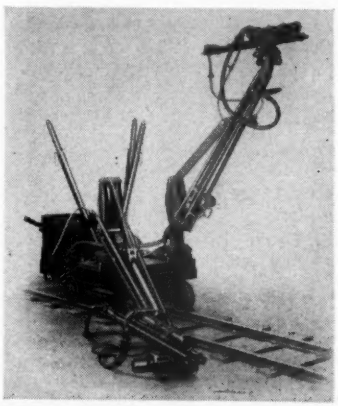
A closed-circuit test unit with a full-size Humphreys Spiral concentrator in operation will be featured in the exhibit. A typical —10 mesh feed will be used so that the separating action and the products can readily be observed and inspected. The unit on display will be the same model as used in many operating plants working on different types of minerals.

• INDEPENDENT PNEUMATIC TOOL CO.

Plans to exhibit a new Thor power-feed drifter and a complete line of new Thor stoper rock drills together with a Thor air column. The entire Thor line of mining tools, including drifters, and assorted maintenance tools will be exhibited. *In charge—W. A. Nugent* and *B. H. Johns.*

• INGERSOLL-RAND CO.

A number of recently-introduced products for the mining industry will be displayed. A new boom jumbo with air-powered booms for mounting drifter drills will be demonstrated in action. A wagonjack, lightweight wagon mounting for Jackhamers, will be a part of the exhibit. One of the main features will be the Carset Jackbits. Many types and sizes of rock drills, drill steel sharpeners, reconditioning equipment, slusher hoists, air compressors, and centrifugal pumps will be included in the display.



• INSLEY MANUFACTURING CORP.

A ½-cu-yard capacity shovel will be shown. *In charge—Kenneth Ackmann.*

• INTERNATIONAL HARVESTER CO.

The new UD-24, Diesel-power unit will be featured in the exhibit of the Industrial Power Division. *In charge—A. H. Mason.*

• JEFFREY MANUFACTURING CO., THE

A background of six enlargements of typical metal-mining installations will be used to demonstrate a number of the company's leading products. A belt conveyor approximately 60 ft long designed for underground service, but which can be extended for above-ground operations; an A-6 post drill; a 5-ft aerodyne mine fan; a midget blower; a vibrating grizzly feeder; a 36 by 24-in. crusher with traveling breaker plate, and four small electric vibrating feeders in closed circuit plus several other items of equipment will be on hand for examination. *In charge—J. H. Fulford.*

• JOY MANUFACTURING CO.

The latest Joy equipment for rock drilling, core drilling, hoisting, scraping, slushing, loading, hauling, and ventilating, in addition to Joy air compressors, will be exhibited. An off-track loader and a shuttle car for trackless haulage will be included in the display. Two types of rock bits and the Joy hydraulically-operated "Drill-jibs" and Silver Streak rock drills and tools will be shown. A new addition to the Joy line of metal mining equipment, the "Axivane" mine fans or blowers will be included. A variety of Joy slushers and hoists, a shovel loader, and manganese steel scrapers will be available for inspection. High-speed drills for blast-hole work and two models of core drills will be shown.

• KENNAMETAL INC.

Kennametal rockbits will keynote the exhibit which will bring out the various characteristics of these bits not similar in nature to those of steel bits. Also, Kennametal tools for use in maintenance shops and for drilling in nonmetallic mineral mines will be on display. *In charge—Richard L. Farris.*

• LE ROI CO.

Familiar Cleveland mining tools will be on display, including the Cleveland "Jumbo" mounted on a car, and equipped with two heavy-power feed drifters. The latest developments in air motors to operate boom jacks will be shown. In addition to its full line of drifters, stopers, and hand sinkers, pavement breakers, demolition tools, clay spades and backfill tampers will be exhibited. *In charge—W. Z. Bancroft.*

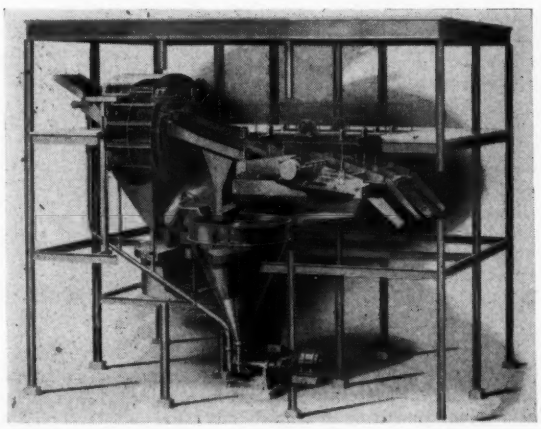
• A. LESCHEN & SONS ROPE CO.

Description not available.

*In charge—A. H. Depelheuer.*

• LINK-BELT CO.

In front of a background of enlarged photographs showing interesting Link-Belt installations at mines and mills throughout the country will be a display of Link-Belt conveyors, vibrating screens, a new Float-Sink concentrator, and the company's complete line of power transmission equipment, electrofluid drives, gearmotors, etc. Experienced specialists will be on hand to consult with visitors. *In charge—Laurance O. Millard.*

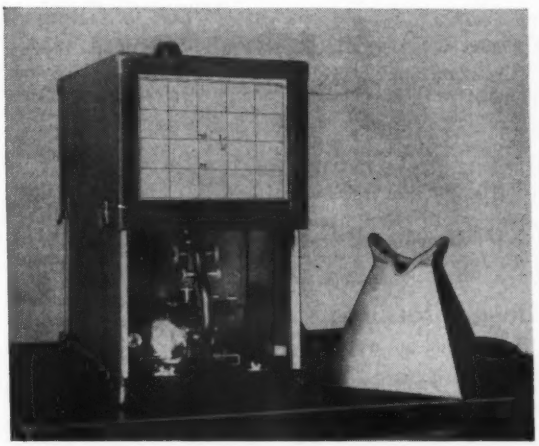


• MARION POWER SHOVEL CO.

Description not available.

• MINE SAFETY APPLIANCES CO.

A variety of safety equipment produced by the company will be included in the exhibit. A rail punch, cable splicer,



and small stud driver will be exhibited. The Chemox breathing apparatus that generates its own oxygen in a chemical canister and the Dust Vue Microprojector that simplifies the counting of dust samples by projecting an enlarged image of the microscope's field upon a ruled translucent screen will be displayed.

• MINING WORLD

Will have on display copies of the magazine and a representative will be on hand throughout the Convention. *In charge—Max Holsinger.*

• NATIONAL MALLEABLE AND STEEL CASTINGS CO.

Parts manufactured for the construction of mine cars will be the key point of the display. Several assemblies of Willison automatic couplers showing their applications and adaptability to mine cars will be a center of attraction. Other products including plain and swivel hitchings, various types and sizes of wheels, various special hauling devices, and an assortment of alloy steel grinding balls will also be included. *In charge—Herbert H. Smith.*

• NORDBERG MANUFACTURING CO.

Plans to have on hand a 22-in. Symons cone crusher and a Symons 3 by 6-ft rod deck screen. The latter will be in operation. An automatic slide projector will show pictures of other Nordberg machinery for processing ores and minerals. *In charge—J. D. Grace.*

• OHIO BRASS CO.

In addition to its line of overhead trolley and feeder materials, rail bonds, and locomotive equipment, the exhibit will feature a new two-circuit permissible distribution box known as the Type KG. *In charge—J. H. Sanford.*

• PETTIBONE MULLIKEN CORP.

Diamond alloy slurry pumps, manganese steel clamshell, and dragline buckets will make up the exhibit. *In charge—J. P. Murtaugh.*

• **PRODUCTIVE EQUIPMENT CORP.**

Demonstrating wet sizing and wet dewatering operations, a small size unit, the Selectro screen, will operate on a slurry. A series of photographs will depict installations on dry-sizing operations. *In charge—L. H. Lehman.*

• **QUAKER PACIFIC RUBBER CO.**

Plans a display including conveyor belt, transmission belt, V belt, and every conceivable type of hose used by the mining industry plus a complete display of piston rod and sheet packing. Engineering advice and information regarding the installation and use of these products will be available. *In charge—J. T. Moore, Jr.*

• **REPUBLIC SUPPLY CO. OF CALIFORNIA, THE**

An actual scale working model of a complete two-way conveyor will be exhibited along with various types of conveyor belting.

• **ROBINS CONVEYORS DIVISION**
**(Hewitt-Robins Incorporated)**

Will center their display around double deck vibrating screen employing the circle-throw principle. *In charge—R. U. Jackson.*

• **JOHN A. ROEBLING'S SONS CO.**

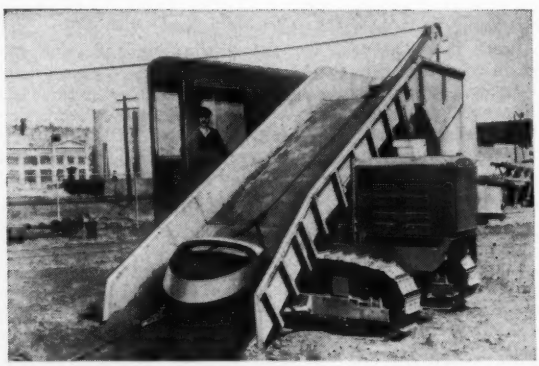
Description not available.

• **SANTA FE TANK & TOWER CO.**

Will include scale models in their exhibit of the mechanical draft cooling tower, acid storage and pickling tanks, a cylindrical water storage tank, wood stave pipe, and a wood tank and tower. Several books showing photographs of installations made throughout the world and catalogues of a descriptive nature will be on hand. The models present the company's products exactly as they are manufactured for sale but on a reduced scale.

• **SAUERMAN BROS., INC.**

An idea will be presented in the exhibit of the more important applications of the principal Sauerman ma-



chines—power drag scrapers, slackline cableways, and tautline cableways. Pictures of typical installations in the mining field will explain the various ways these machines are used and small models will explain mechanical details. Several sizes of Durolite all-steel blocks will be on hand. *In charge—D. D. Guilfoil.*

• **SOCONY-VACUUM OIL CO., INC.**

Description not available.

• **SPERRY-SUN WELL SURVEYING CO.**

The exhibit will include gyroscopic well-surveying instruments used by the oil industry and inclinometers and magnetic well-surveying instruments. A polar core-orientation instrument used for determining the residual magnetism in the core sections to determine their orientation in the ground will be displayed.

• **SYNTRON CO.**

Vibratory material-handling equipment of a varied nature will be featured in the exhibit. Electro-magnetic vibrators for promoting the flow of material from bins, hoppers, and chutes—vibra-flow vibratory feeders featuring variable control at the rate of flow—vibratory spiral elevators, lifting material vertically by vibration—and vibra-flow vibratory dewatering screens will be on hand. Also a new line of helical rotor pumps together with pump shaft seals, portable electric tools, and a self-contained portable gasoline hammer paving breaker will be included. Sales and engineering personnel will be in attendance.

• **W. O. & M. W. TALCOTT, INC.**

Will exhibit belt fasteners of various sizes and shapes used extensively in the mining field on both heavy transmissions and conveyor belting. Actual joints on both types of belts will be available for inspection. *In charge—M. W. Talcott.*

• **TAMPING BAG CO.**

Will feature their wet-strength bag made of a specially treated paper for use in wet working conditions or where rough handling may cause bag failure. Samples of both standard and wet-strength paper will be available for comparative tests. *In charge—Alfred E. Pickard.*

• **TIMKEN ROLLER BEARING CO.**

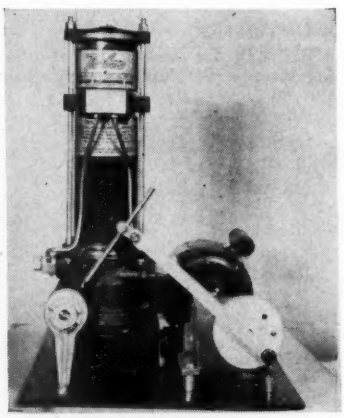
Description not available.

• **TOOL STEEL GEAR AND PINION CO., THE**

Plans to have on hand many cutaway sections of tool steel process parts and equipment. These sections will illustrate the various types of products manufactured and the depth of hardness put on wearing surfaces. Some of the parts on display have been bent to show the ability of the parts to resist shock and strain.

• **TRABON ENGINEERING CORP.**

Will exhibit both manual, mechanical, and motor driven centralized lubricating systems. Oil and grease hose, copper tubing, tube fittings, swivel connections, and other accessories used in lubrication systems will be included in the display. A group of western representatives of the company will be on hand to explain the equipment and offer its services to the mining industry.



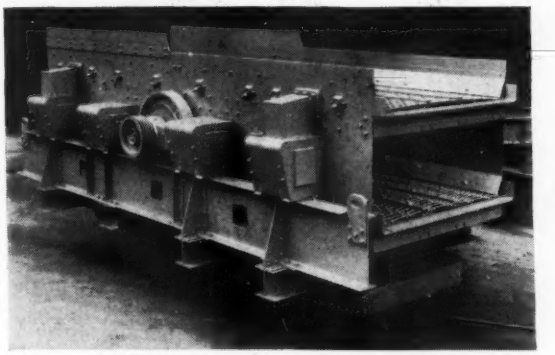
• **TRAYLOR ENGINEERING & MANUFACTURING CO.**

Enlarged photographs of Traylor metallurgical machinery installations will constitute the display. No special piece of equipment is featured but representative photo-

graphs will show copper converters, casting wheels, furnaces, tension rod rollers, kilns, crushers, and grinding mills produced by the company for the mining and milling industry. *In charge—C. Hayward Roberts.*

• W. S. TYLER CO., THE

A 4 by 8-ft one-surface Ty-Rock screen will be on display in actual operation. The exhibit will also include a variety



of woven-wire screen of the types used in various screening, filtering, and dewatering operations of the mining and milling industry. *In charge—E. M. Graham.*

• ULTRA-VIOLET PRODUCTS, INC.

Three new low-priced models of Mineralight lamps will be demonstrated. Both long- and short-wave lamps will be on hand for examination, including models which are operated on 110 v current and those designed for battery operation. All the lamps will be demonstrated with a variety of fluorescent minerals.

• UNION WIRE ROPE CORP.

Fluorescent lighted transparencies showing end views of the many ropes used in the mining field will be on display. A new 3 by 19 slusher rope and the new "Tuffy" sling along with other samples of ropes used by the mining industry will also be shown. *In charge—Ray G. Noble.*

• U. S. STEEL CORP.

Many of the products produced by the various subsidiaries of the corporation for use by the mining and milling industry will be featured, including wire rope, pipe, special steels, electrical cords and cables, rail bonds, floor plates, and fencing. *In charge—J. A. Burgard.*

• VICTAULIC CO. OF AMERICA

A complete line of Victaulic pipe couplings for mine and mill piping systems will be on display along with the new Vic-Groover portable pipe tools that may be operated either by hand or with power attachments. Operating units carrying air and water pressures will demonstrate the application of Victaulic jointing. *In charge—R. W. English.*

• WESTERN CARTRIDGE CO.
(Division of Olin Industries, Inc.)

A complete line of blasting caps and dynamites will be on display. A series of translite photographs will depict the various properties and construction features of blasting caps. A series of dynamites manufactured by various powder companies will also be shown in addition to accessories used in blasting operations. *In charge—A. J. Barocca.*

• WESTERN MACHINERY CO.

A lucite, glass, and stainless steel model will actually demonstrate Heavy Media separation by means of black light. A "Mill Game" will be a feature of the exhibit offering prizes to visitors who locate leading mills properly on a huge wall map. *In charge—Robert Herniund.*

• WESTERN ROCK BIT MANUFACTURING CO.

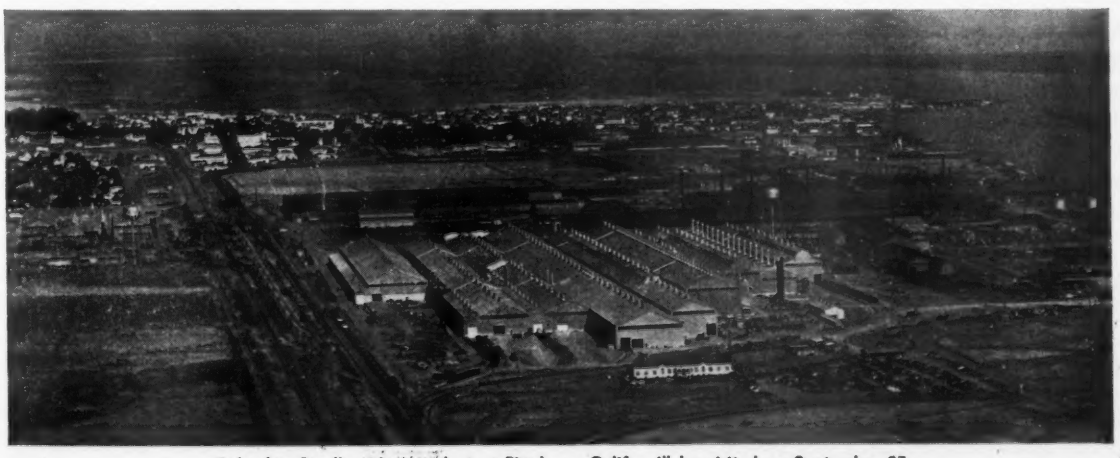
A joint display with Thompson Products, Ltd. will show the various sizes and types of Liddicoat bits. Samples of drill rod prepared for use with Liddicoat bits will also be available for examination. Experienced personnel will be available to discuss the use of these bits.

• WESTINGHOUSE ELECTRIC CORP.

Will present views of the company's apparatus in various metal-mining operations. Expert personnel will be on hand for discussing industry problems.

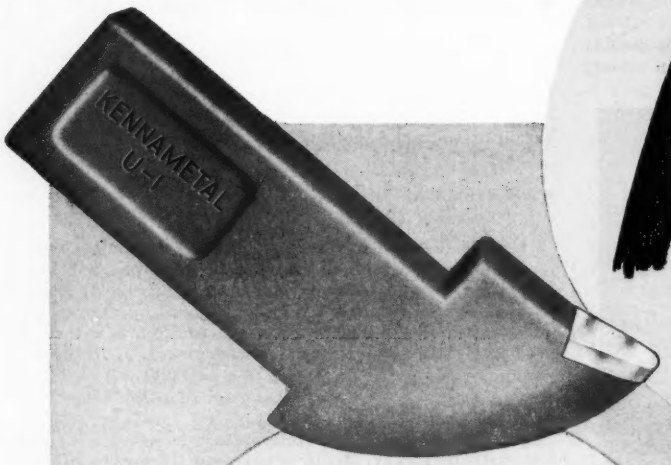
• WORTHINGTON PUMP AND MACHINERY CORP.

Representative models of the full line of drifters and stopers, self-priming centrifugal pumps, portable and semi-portable compressors, and air tools will be shown. *In charge—Roy E. Rodenhuis.*



Columbia Steel's 400-acre plant at Pittsburg, Calif., will be visited on September 25

# A Kennametal *bit that cut*




**175**

**places before it was sharpened**

**1000**

**places before wearing out**

These are figures taken from performance data collected by a satisfied user of Kennametal cutting machine bits in a Washington County, Pennsylvania coal mine. Comparing Kennametal bits with steel bits cutting coal in the Pittsburgh seam, mine operators found that steel bits cut 4 places before sharpening; Kennametal, 175. A margin of 171 places with Kennametal under conditions that were identical. A thousand places were cut before the bits wore out, about 16,000 tons of coal mined. And the bit cost figured only .4 of one cent per ton.

This mine used the new bits on a Jeffrey 35BB cutting machine having a 9′ bar, and 9′ by 12′ places were cut at the rate of 13 minutes per place. When steel was used it took 18 minutes per place, and the cutting machine consumed 25 to 33% more power. Moreover, enough time was saved in an eight-hour shift to pay for all the 42 Kennametal bits in the cutter bar chain. Such facts as these help to explain why more and more coal mines use Kennametal bits every day. And why they may be able to help you bring about more economical coal cutting.

If you would like a demonstration, our representative in your district will be glad to contact you. Simply write—Mining Division, Kennametal Inc., Latrobe, Pa., giving your name and address. As prompt delivery can be made, we suggest you write today!

**KENNAMETAL**

SUPERIOR CEMENTED CARBIDES

KENNAMETAL *Inc.*, LATROBE, PA.

# TAKE YOUR CHOICE!

## For LOW COST ORE Production

These two machines handle overburden or ore profitably in any mine. They are TRUE mining shovels, built and powered to stand the gaff in tough, hard digging. They are FAST... big yardage producers in any going. They are ECONOMICAL... low in operating cost... high in efficiency ... and require a minimum of maintenance. They will save you money on all material handling jobs.

Let us solve your material handling problem.

Write for Bulletins describing these two MARIONS.

## MARION 111-M

This Diesel machine provides a new conception of shovel performance plus the advantages of Ward Leonard electric swing, air control and many other features that account for profitable operation. Quickly converted to dragline service.

## MARION 151-M

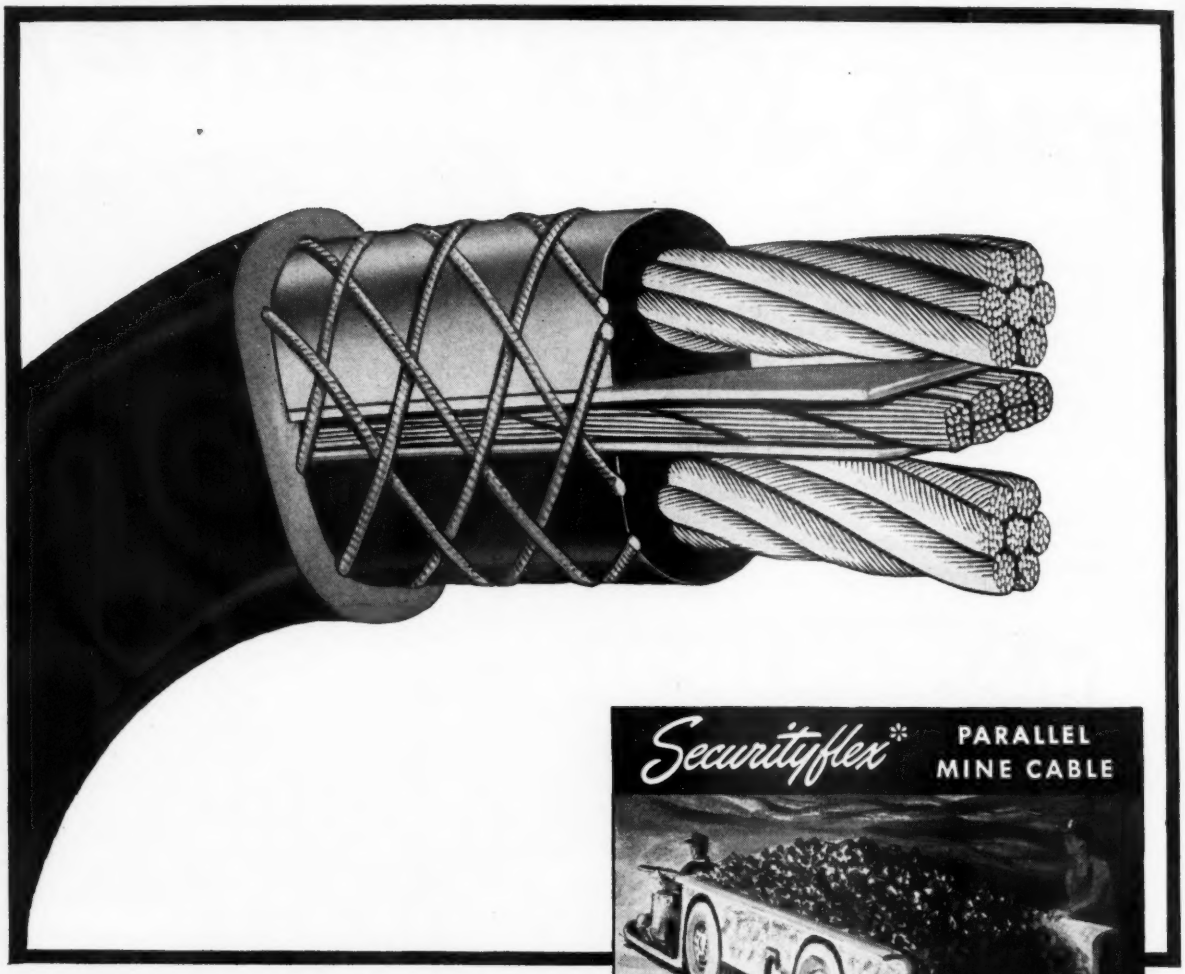
Where the going is REALLY TOUGH, this heavy duty 6 yard machine fills the bill. It will give you top production in the mining of coal, iron or copper. Readily converted to dragline.

**MARION**

**POWER SHOVEL COMPANY**

MARION, OHIO, U. S. A.

*Offices and Warehouses in all Principal Cities*



# BUILT TO DELIVER
# MORE TONS PER CABLE

"SECURITYFLEX" has grown to mean *leadership* in mine cable as a result of . . .

Anti-short breaker strip between conductors (available in cable with or without grounding wire) . . . crush resistance . . . special heat resistant insulation . . . rugged neoprene jacket that resists flame and abrasion . . . non-kinking construction . . . assurance of more continuous service. All this means *more tons per cable.*

Securityflex meets all requirements of the U. S. Bureau of Mines Flame Test and diameter specifications. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

## NEW DESIGN GIVES LONGER SHUTTLE CAR SERVICE

Shuttle car service demands a cable that can take it. The inherent advantages of Securityflex Parallel Mine Cable, coupled with a recent improvement in design that greatly reduces grounding wire failures, make this cable more suitable than ever for shuttle car use. You will find this parallel mine cable gives longer, safer operation under the extreme cable tensions encountered in shuttle car service.

48475

**ANACONDA** *Securityflex** **MINE CABLE**

ANACONDA
from mine to consumer

*An Anaconda Trade-Mark

# Power For Nevada's Mines

**Lack of Interconnecting Power Lines Seriously Affected Nevada Mining in the Spring of 1948. With Little Possibility of Increasing Power Production Within the State, It Is Urged That Existing Sources of Power Be Linked Together to Avoid the Recurrence of Crippling Power Shortages.**

★

By J. A. CARPENTER
Director
Nevada State Bureau of Mines

★

AN unusually dry winter with the consequent reduced amount of hydroelectric power produced forced northern California and Nevada to cut by 20 per cent the demands of all power consumers.

Mines were forced to eliminate night shifts and reduce crews, the enticing bright lights of the gambling casinos and store windows went out, and houses changed 60-w lights for 20's.

An immediate study of sources of assured power for Nevada was urged. Fortunately such a study had been proceeding that considered the present and future power needs of the mining industry of the State, as well as the demands of all consumers. The report covered the principal mines of the state and their power consumption, showing a present consumption of 200,000,000 kwhr per year, with an estimated 40 per cent increase by 1950, and a 75 per cent increase by 1970.

## Increased Domestic Power Production Unlikely

Little possibility exists for generating power within the State of Nevada as no coal, petroleum, nor natural gas has been produced. Also Nevada has limited sites for hydroelectric installations. Thus almost all of Nevada's power supply comes from around the edges of the State. Coal from Utah is brought in for power generation only in the Ely district on the eastern fringe of Nevada where it is also used as fuel for smelting with waste-heat generation of electric power at a cost of less than 1¢ per kwhr. California oil and gasoline is brought in and distributed over the entire state and is the principal source of energy outside of imported and some local hydroelectric energy.

The principal sources of hydroelectric energy within Nevada come from small plants along the Truckee River, plus one on the Carson River and one on the Ruby Mountains south of Elko. In the southeast tip of the State, between Nevada and Arizona, is one of the largest sources of hydroelectric energy in the United States, the Hoover Dam and Lake Mead, with a firm or assured hour output of 4⅓ billion kwhr per year. Of this supply of 660,000 hp the law entitles Nevada to 18 per cent. Although it was not expected in 1939 that either Nevada or Arizona would be able to use their allotments for many decades to come, wartime construction of the huge Basic Magnesium Inc. plant at Henderson, Nev., used 1.3 billion kwhr annually, an amount greatly in excess of Nevada's allotment. This privilege ended with the war's end.

Units of this immense plant were purchased by several organizations, although under the WAA these tenants had no assurance of permanence as the entire plant at one time had been declared as surplus to be sold off.

## Action Taken to Provide Low-cost Power

In the recent emergency the Nevada Colorado River Commission arranged for the purchase of power from the California allottees to 1951 based on the price of oil with the resulting cost now as high as power contracts in the Los Angeles area, or 5 to 7 mills. In 1951 Nevada expects to take over a generator of its own with power at the generating cost.

Principally through the efforts of Senator Pat McCarran, Nevada has been given an option to buy the huge BMI plant for $24,000,000 in 20 years, with a $1.00 down payment. Also the State has the right to sell off buildings and equipment to apply on the purchase price. This plant originally cost $140,000,000 to construct.

Thus low-cost electric energy is assured in 1951. Several large companies are now negotiating for space. Nevada authorities will attend to the distribution of power and water and care for the town.

At present there are two large users of Nevada power from the Hoover Dam. One is the Southern Nevada Power Co., supplying Las Vegas and adjoining areas, with 140,000,000 kwhr annually. The Blue Diamond Co. of Los Angeles, operating a gypsum mine near Arden, used 5,000,000 kwhr in 1947. This company mines about 800 tons a day with a personnel of 300 men. The Pioche Power District supplies power to the Pioche mines and adjacent territory. Both of these power companies pay but 2.25 mills for their electrical energy, the generating cost. This low-cost power has been a great factor in the development of the Pioche district into one of the great lead-zinc districts of the United States.

A 156-mile line was built with Federal aid in 1937 at a cost of $900,000 with about one-third as a grant, one-third in bonds taken by the Government, and one-third by Mr. Snyder's associates. At that time these 20-year bonds were considered a risky investment, but today money is on hand to take them all up.

In 1947 the Pioche District consumed 30,000,000 kwhr with Combined Metals using 20,000,000, of which 1,000,000 kw per month was used for pumping around 2000 gpm of water from the 1200-ft level.

The electric power for Tonopah, Goldfield, Silver Peak, and Round Mountain has been supplied since 1906 from the Sierras in California by the California Electric Co. Power for Reno, the Comstock, and up the Humboldt River to over half way across the State to Battle Mountain, is supplied principally by the Pacific Gas & Electric Co. This power is distributed by the Sierra Pacific Power Co. that owns the local hydroelectric plants.

Power for the northeast corner of the State is supplied by the Idaho Power Co. to Mountain City and Jarbidge. Elko and Wells on the upper Humboldt have local power plants, principally Diesel, and lines extend down the Humboldt to Carlin. No electric power is available in the en-

(*Continued on page* 104)

Condensed from an address to the Mining Association of the Southwest, June 1948.

# JOY LOADERS and SHUTTLE CARS

## are proving every day, month in and month out, that they do increase output, and that they do cut costs!

Loading iron ore,—there is nothing complicated or complex about the operation and control of a Joy Loader—every move is plainly visible to the operator.

The operator not only has finger tip control of the Loader at all times—but he is safe and protected.

The strong swinging arms of the Joy 18-HR digs into the muck—loads iron ore fast, continuously.

The Joy 18-HR picks up the muck, and transports it, fast, into a Joy 60-E Shuttle Car.

Joy 18-HR loading shuttle car with iron ore—note simplicity of operation.

Joy 60-E Shuttle Car enroute to conveyor—fast, safe and built to stand hard usage.

Joy Shuttle Car emptying iron ore into Joy Elevator Conveyor—operation is fast—saves time and labor.

Joy Elevator Conveyor discharging iron ore into mine car for transportation to surface—operation is fast and keeps cars moving.

**The successful, fast, low cost loading and underground transporting of iron ore as illustrated, also other types of hard rock has definitely proved the value, utility and stamina of**

# JOY MECHANIZED EQUIPMENT.

*Consult a Joy Engineer*

## JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

# Construction Details of the STOTESBURY AIR SHAFT

**In the July Issue of Mining Congress Journal the General Story and Illustrations of This Unusual Shaft Construction Appeared. In Response to Requests for Further Information the Construction Details are Presented**

By JOHN D. KALASKY
Plant Engineer
Eastern Gas and Fuel Associates

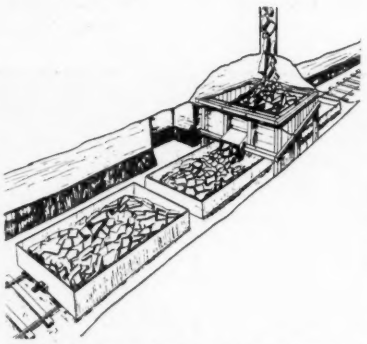
PRELIMINARY shaft sinking work consisted of churn drilling an 8-in. pilot bore hole to determine the nature of the strata and water areas to be encountered in sinking the shaft. The log of this hole provided the information that a pregrouting program to seal off excess water was unnecessary. Its ultimate use in the shaft was to dewater the shaft by means of tap-ins from any water area that might be encountered in the shaft.

This drain hole was drilled 16 ft from the center of the circular shaft for easy tapping by drill holes from the circumference of the shaft where necessary and set on the surface so as to enter a shaft pillar adjacent to one of the shaft approaches at the bottom.

The drill rig was then moved over to the center of the shaft and the 20-in. mucking hole drilled. During this time the bottom approaches to the shaft area were being prepared by the mine crew. The use of this 20-in. hole was to facilitate shaft sinking by dropping the debris down the hole and picking it up with a rock loading machine. As this shaft was of such dimension that 8500 tons of rock would have to be loaded mechanically, this was figured a difficult task. The rock-loading machines were being used elsewhere in the mine and it was then decided that a bin would be constructed to facilitate the handling of the rock at the bottom in such a way that it would flow freely into the mine cars.

A bin was constructed of wood and the bottom lined with 130-lb railroad steel. Cross members, braces and posts consisted of 10 by 10-in. timber bolted together and the main supports of the bin bottom were pin-timbered to the rock walls.

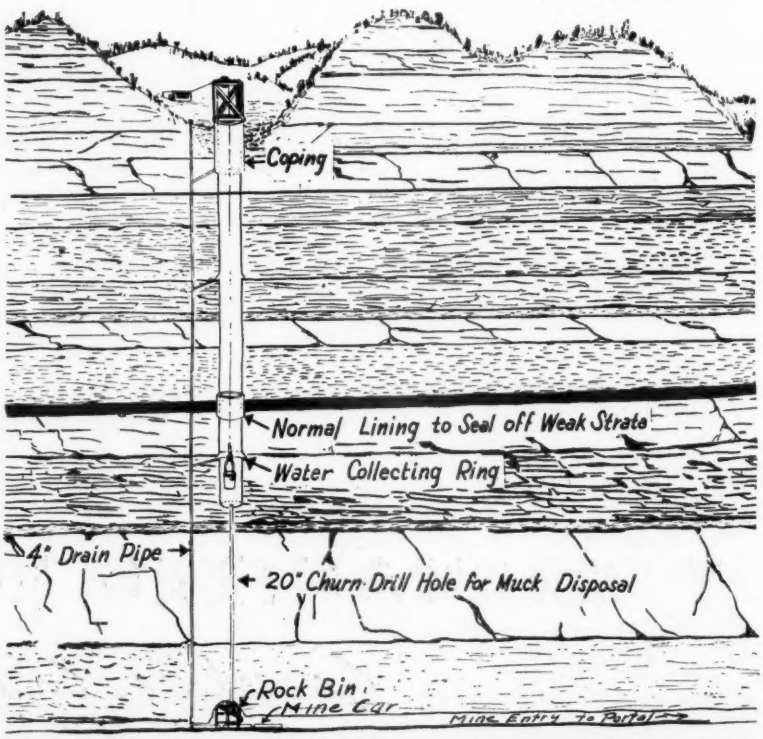
It was realized that to keep a bottom in the bin it would be necessary to provide something to absorb the shock of the falling rock before it hit the bottom of the bin. A grizzly consisting of five 130-lb steel rails placed in a 2-2-1 upward position and pin-timbered into the rock wall so as to place them close to the bottom of the hole were used. They were also supported by vertical timbers at the ends directly under the pins. The bottom of the bin was sloped at about a 45-deg angle and the throat of the bin equipped with a hand operated gate chute.



Rail-lined bin at base of 20-in. churn drill collected broken material

This grizzly did not last long because of the terrific blows it underwent which were assumed to be anywhere from 50 to 75 tons. They did last long enough to pulverize sufficient rock to the extent that it would lay at the angle of repose in the bin and no further trouble occurred. One man operated the bin with five cars and the cars were moved with a small car hoist. It was only necessary to close

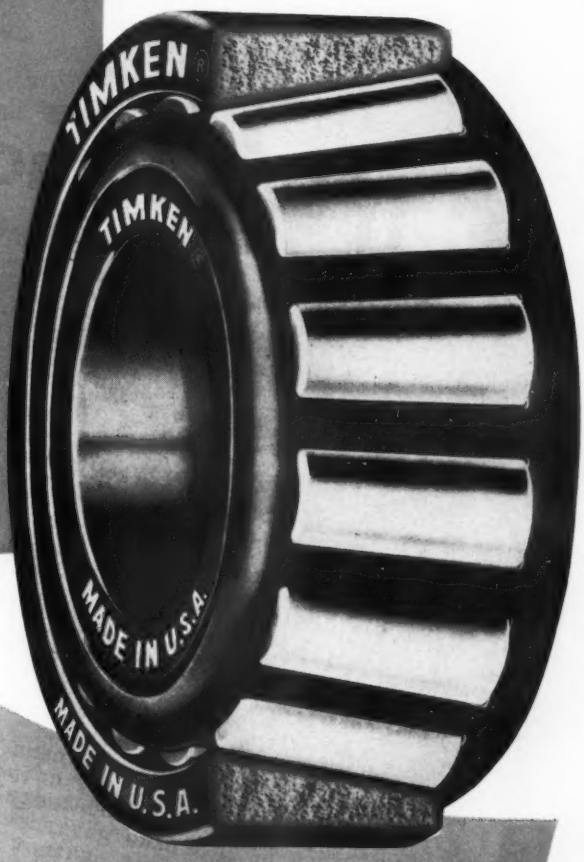
(*Continued on page* 104)




Log of pilot hole on left provided information on conditions encountered in sinking air shaft

# 96%

## OF THE EXHIBITORS AT THE 1948 METAL MINING EXPOSITION, SAN FRANCISCO,




As of June 23rd, 87 companies are listed as exhibitors at the Metal Mining Show. 58 of them manufacture mining equipment in which bearings are used. 56 of these manufacturers — 96% — use Timken tapered roller bearings.

## *use* TIMKEN® *bearings in the mining equipment they manufacture*

**TIMKEN**
TRADE-MARK REG. U. S. PAT. OFF.
*TAPERED ROLLER BEARINGS*

**THE TIMKEN ROLLER BEARING COMPANY**
**CANTON 6, OHIO CABLE ADDRESS "TIMROSCO"**

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◎ AND THRUST →◎← LOADS OR ANY COMBINATION ✳

UNION PACIFIC

# The Governor of Nebraska invites You

VAL PETERSON
GOVERNOR

STATE of NEBRASKA
EXECUTIVE OFFICE
LINCOLN

To American Industry:

In the last decade, Nebraska's productive capacity has grown threefold. Modern industry has found in increasing numbers that Nebraska's diversified assets form the economic cornerstone of a better tomorrow!

Here there is respect and reward for individual initiative, whether its hallmark be overalls or a business suit. Nebraskans prize ingenuity, cooperation and achievement. Their fundamental faith is reflected by Nebraska government in a conscientious resolve against debt, restrictive taxes and regulatory legislation.

In behalf of all citizens, I invite industry to share Nebraska's unique heritage as the continental crossroads of commerce and heart of a land unmatched in natural wealth.

Sincerely,

Governor

Val Peterson

* One of a series of advertisements based on industrial opportunities in the states served by Union Pacific Railroad.

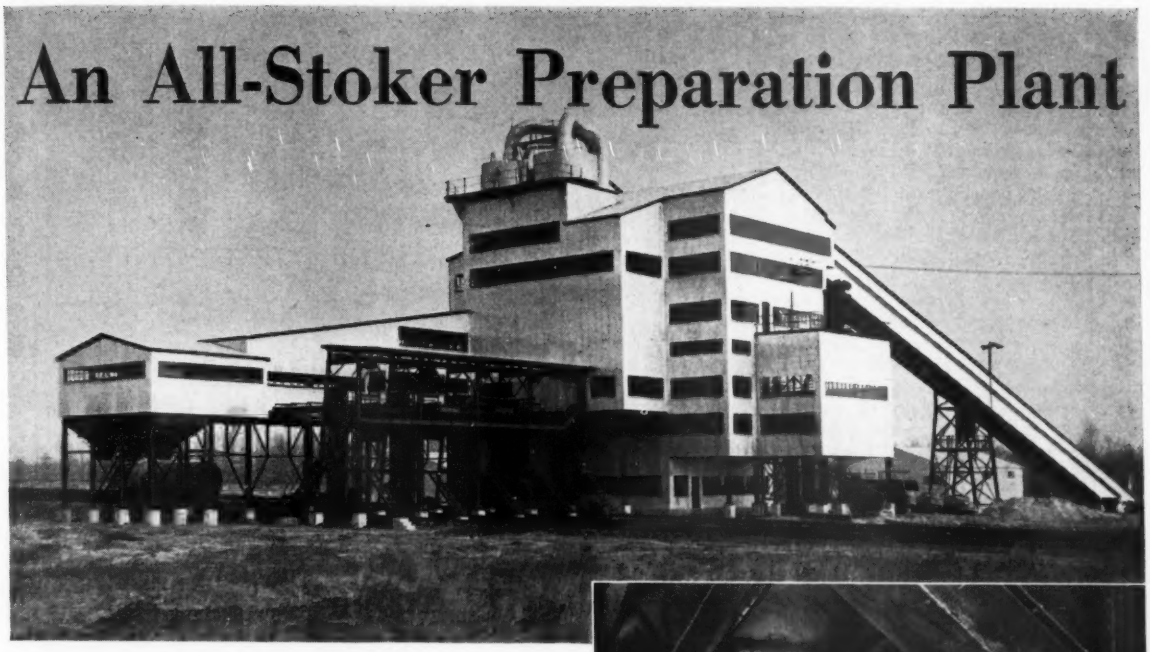
Unite with Union Pacific in selecting sites and seeking new markets in California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, Oregon, Utah, Washington, Wyoming.

*Address Industrial Department, Union Pacific Railroad
Omaha 2, Nebraska

**UNION PACIFIC RAILROAD**

*Road of the Daily Streamliners*

# An All-Stoker Preparation Plant

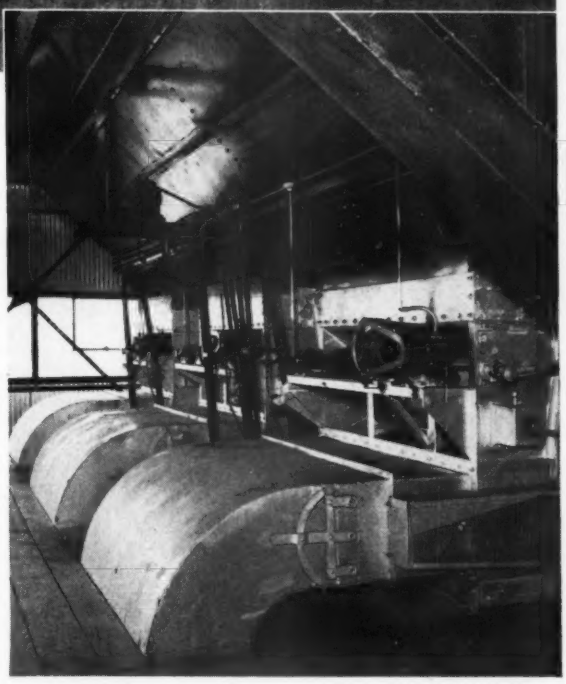


Over-all view of the plant

## New Preparation Plant of the Freeman Coal Mining Corporation in Southern Illinois Designed to Process Coal to Meet Needs of Present and Future Markets

By WM. C. McCULLOCH

Preparation Manager
Roberts & Schaefer Co.



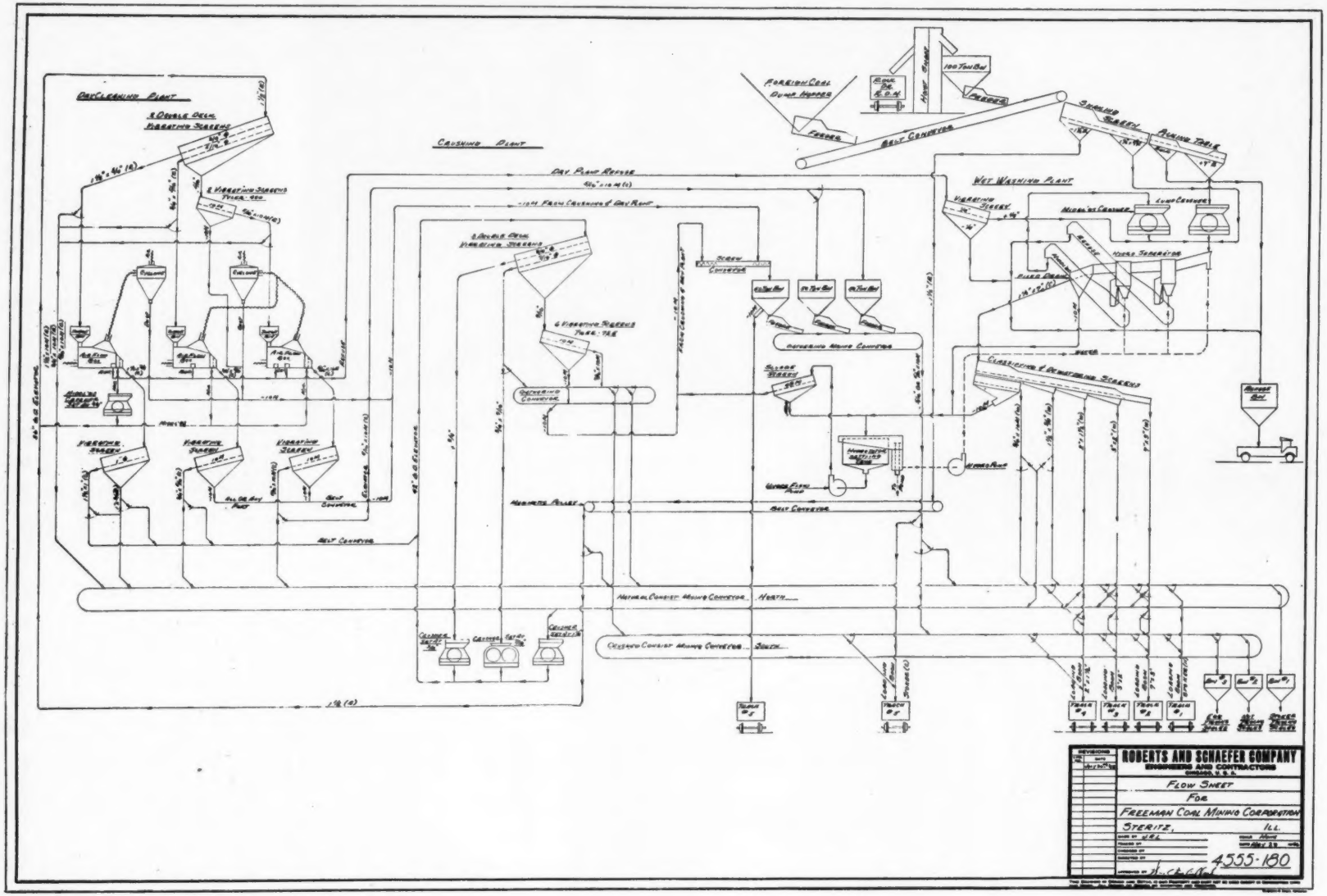
Feed end of Stump Airflow units

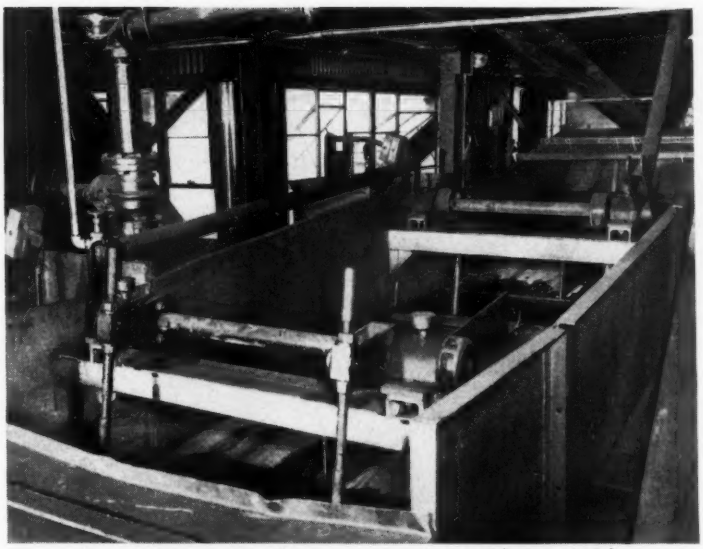
ANOTHER new coal cleaning plant has just gone into operation in southern Illinois. Modern in its equipment and modern in its products, this plant exemplifies the trend of the industry toward the preparation of processed coal with a combustion efficiency that will meet the competition of other fuels. The design combines wet and dry methods—water washing for coarse coal and pneumatic separation for the smaller sizes, both with special arangements to insure sizing and quality standards and to eliminate waste in the rejects. It has been called an "all-stoker" plant because the crushing and screening facilities can convert the entire product into stoker coal if desired; this, however, does not prevent the preparation and loading of any other size or combination of sizes within the entire range from lump to slack. The capacity is 400 tons of feed per hour.

### General Surface and Underground

The new installation, designed and constructed by Roberts & Schaefer Co., is situated at Steritz near Herrin, Ill., on the I. C., M. P. and C. B. & Q. Railroads. It serves as a central cleaning plant for three mines of the Freeman Coal Mining Corp., having a combined production of 12,000 tons per day. The plant is located at the site of No. 3 Mine—known as Freeburn Mine—a shaft operation now under construction that is suitably located to develop the future reserves of the company. Coal from Nos. 1 and 2 Mines is brought there by railroad, but as both of these tipples have screens and picking tables, it is not necessary to transport their entire output to the central plants—only that needed for special products.

The three mines are in the No. 6 seam, that sets the standard in quality for southern Illinois coal. Natural conditions as a whole are favorable; the coal lies nearly level and has a height of 9 ft. One foot of top coal that is left unmined provides an ex-


DRY CLEANING PLANT
CRUSHING PLANT
WET WASHING PLANT
FOREIGN COAL DUMP HOPPER
BELT CONVEYOR
ROBERTS AND SCHAEFER COMPANY
ENGINEERS AND CONTRACTORS
CHICAGO, U.S.A.
FLOW SHEET
FOR
FREEMAN COAL MINING CORPORATION
STERITZ, ILL.
4555-180



Two Hydroseparator cells remove pure reject and bony material

cellent roof and there is only one persistent parting—a slate band about 2 in. thick in the lower part of the seam. With the adoption of mechanical cleaning, no attempt is made underground to hand pick impurities. This system conforms to general practice in this field where "full seam mining," as the term is used today, probably had its origin as a logical step in the development of complete mechanization.

The new operation at No. 3 will, in general, follow mining practices that have been found successful at Nos. 1 and 2. Mechanical loading will be used throughout with Joy machines loading into Jeffrey shuttles that transport to the gathering track haulage and discharge into 7½-ton, drop-bottom mine cars. The coal will be bottom cut by a Jeffrey track-mounted universal, and shearing may be adopted if found advisable to improve the size consist. Shooting will be with Airdox. All operations are shaft mines. At Nos. 1 and 2, the cars are hoisted and dumped at the surface, but No. 3 mine will have a skip hoist with the mine cars dumping underground.

## Washing Removes Bulk of Impurities

Accepted practices followed in the preparation flow sheet with pre-sizing before cleaning and the first step in the process is primary screening. These screens are the reciprocating type and separate the run-of-mine coal feed into three sizes—plus 6 in. lump, 6 by 1½ in., and 1½ in. by 0 with 1½ in. round-hole screens making the division between the products for wet washing and dry cleaning. The plus 6-in. lump is inspected and hand picked to remove any impurities or foreign matter that would be injurious to the crusher such as wooden mine props, slabs, or any tramp iron. The crushed lump is returned to the 6 by 1½ in. coal and this combined product constitutes the feed to a single tandem Hydroseparator.

The first cell of the Hydroseparator removes pure reject that is delivered to the refuse bin. The second cell removes bony or laminated material that is crushed and returned to the raw coal field. The washed coal goes to a draining and sizing screen from which it is delivered either to loading booms or to crushers for further preparation. The water from the draining screen flows to a Hydrotator settling tank from which the clarified overflow water is pumped back in closed circuit to the Hydroseparator cells. The underflow from the settling tank is pumped to a vibrating sludge screen in the top of the plant and the recovered wet sludge is mixed with the dry dust and returned to a bin for loading. The underflow from the sludge screen is returned to the settling tank in closed circuit.

## Pneumatic Processes Clean the Coal

The 1½ in. by 0 raw dry coal from the primary shaker screen is delivered to a set of vibrating screens to be sized into 1½ by ¾ in., ¾ by 5/16 in.,

Sizing by vibrating screens precedes pneumatic cleaning

5/16 by 10 mesh, and 10 mesh by 0. These sizes are for convenience and efficiency in the pneumatic cleaning processes. After the first slate removal, all the coal may be recleaned, sized, crushed, and resized as hereinafter described so that the final market product conforms to the above-mentioned description of an all-stoker plant, being various sizes of stoker coal or 10 mesh by 0 fine coal.

The 1½ by ¾ in. coal is delivered to a standard single-pack Stump Airflow for separation into a clean coal, middlings, and reject. The reject may be delivered to the refuse bin or it may be delivered to the Hydroseparator washer for recovering any coal that it might contain. The middlings product is delivered to a crusher for reduction to ¾-in. top size after which it is delivered to the raw coal vibrating screen for resizing. The clean coal, after rescreening to remove degradation, is delivered to the loading booms or to crushers for subsequent stoker coal preparation.

The ¾ by 5/16 in. from the primary screens is delivered to a standard two-pack Stump Airflow that separates it into clean coal, middlings, and reject. The reject is delivered to the refuse bin and the middlings are returned to the feed for retreatment. The clean coal, following screening to remove degradation, is delivered to the mixing conveyor.

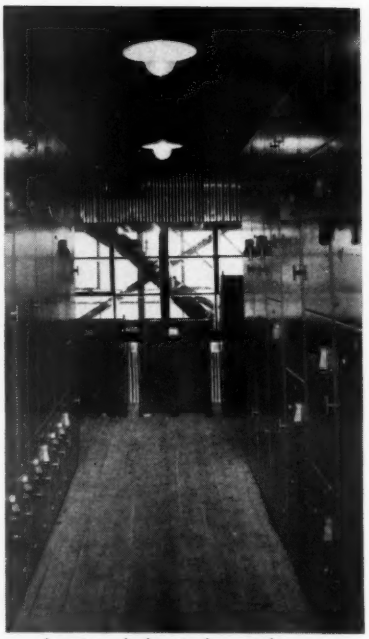
The 5/16 by 10-mesh raw coal is fed to a standard three-pack Stump Airflow to be separated into one or more reject products, middlings, and clean coal. The reject is delivered to the same refuse bin with the larger sizes; the middlings are recirculated to the feed; and the clean coal is delivered to the clean coal bin or to other loading or mixing points.

The 10 mesh by 0 undersize is delivered to a bin for loading in combination with the sludge product previously mentioned and the cyclone dust recovered from the dust-recovery units associated with the Stump Airflow.

## Mixing and Blending Results in Preferred Product

Any one of the washed egg or nut sizes or the 1½ by ¾-in. clean coal from the Stump unit may be delivered to a crusher, set at an approximately 1½-in. opening. The crushed coal is elevated to a battery of Hummer screens for making the stoker coal sizes previously mentioned. In turn, any of the stoker coal sizes larger than ¾ in. may be delivered to a second stoker coal crusher, set at ¾ in. and this crushed product similarly is returned by the elevator to the battery of screens. A third step in the stoker coal process includes returning any of the sizes larger than 7/16 in. and this product likewise is returned by the elevator to the vibrating screens.

Facilities have been provided to oil treat any of the stoker coal sizes or the larger nut sizes that are prepared for domestic fuel. Several by-pass and mixing arrangements permit the loading into railroad cars combinations of any or all of the various sizes prepared. Blending facilities include special mixing to combine the wet sludge with the dry 10 mesh by 0 and cyclone dust. Other mixing conveyors permit loading these several sizes on the several loading tracks either through chutes or through the loading booms provided for the larger sizes. In turn, the several products that have been delivered to the clean-coal storage bin may be recombined in any predetermined ratio for railroad car loading.



Interior of electrical control room

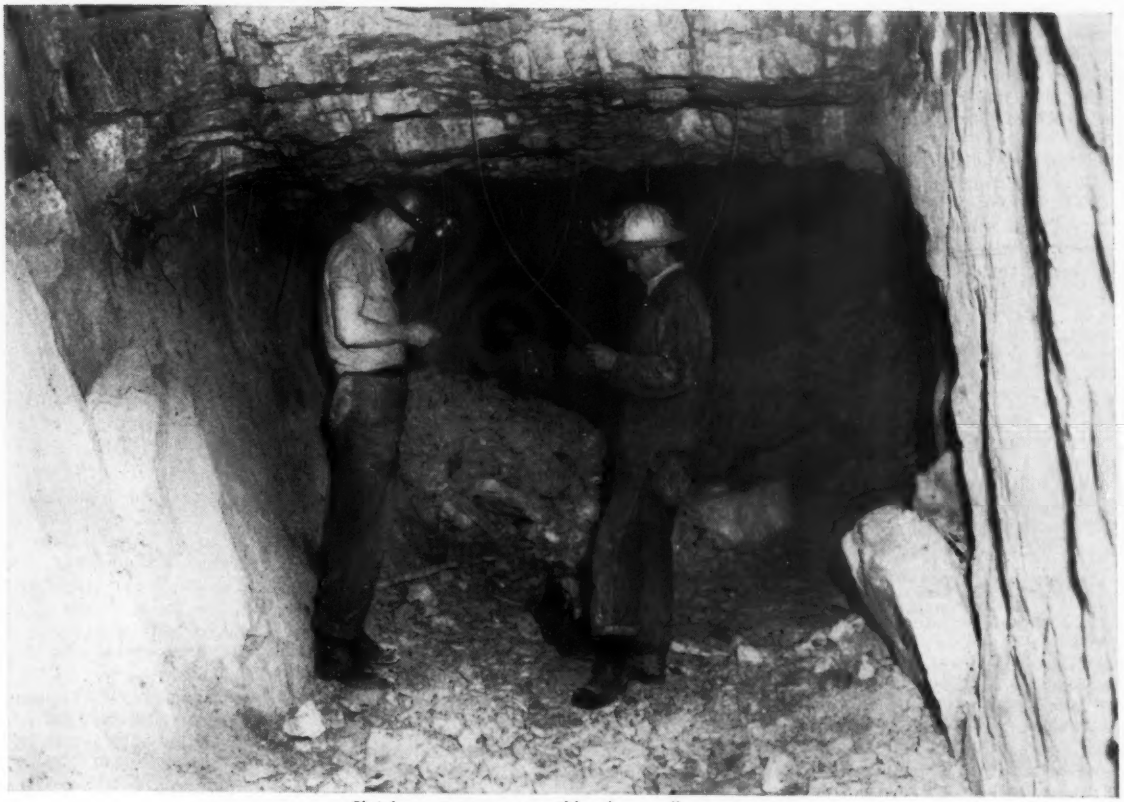
The building is of steel construction with wood flooring and corrugated iron siding, well lighted by numerous windows and by artificial illumination. There are five railroad tracks, four with loading booms, and in addition, there is a bin for truck loading.

## Convenient Surface Coal Handling

As previously mentioned, the new installation serves as a central cleaning plant for three mines. The railroad cars bring the coal from Nos. 1 and 2 mines, dump into a 50-ton steel bin; coal from No. 3 shaft dumps into 100-ton steel bin built integrally with the head frame. Each of these bins has a reciprocating feeder to load a belt conveyor for elevating the coal to the top of the cleaning plant and serves as the main feed to the primary screens. The conveyor line has a length of 260 ft center to center of pulleys and is on a 17 deg slope; the belt is 42 in. wide and at a speed of 400 fpm, has a capacity of 400 tons per hour.

No. 3 is a skip operation; the shaft is circular in construction, 16 ft in diameter with two skip compartments. The coal lies at a depth of 217 ft below the surface. The shaft is sunk considerably lower to provide for a 135-ton surge bin underground to handle mine car discharge and load skips. Each skip is 4 tons capacity of the drop-bottom discharge type and loads into a 100-ton bin at the head frame.

Mixing conveyors blend coal to make several products



Shrinkage stopes are possible where walls are strong

# North Carolina Tungsten

## The Operation of an Important Source of Strategic Metal Faces Serious Problems

By FRANK H. BISHOP

Vice-President and General Manager
Tungsten Mining Corp.

DISCOVERY of huebnerite in Vance County, N. C., in the spring of 1942 by Joseph and Richard H. Hamme has been followed by active development to bring the deposit to a stage of great importance to our economy as a major supplier of tungsten. A decline in price combined with a nearby flood control project may hamper its continued expansion.

When the Hamme brothers first discovered heavy brownish crystals of huebnerite in quartz they sent a selected sample to a younger brother, John V. Hamme, who was then studying metallurgy at the University of Utah. He had the sample analyzed and advised his brothers in North Carolina of the nature of their find. They then proceeded to tie up the mineral rights over a large acreage in the vicinity of the original find.

A stamp mill and two Wilfley tables were brought in and float and ore from open pits was milled to produce 13,000 lb of $WO_3$ concentrates. Selected ore gave 60 per cent recovery. Realizing that the project was a bit too large for such a small operation, the Hamme brothers made a deal with Haile Mines, Inc., who took over the property August 1, 1943. Additional equipment was installed and production continued. Between August and December 1943, 60,500 lb of concentrates averaging 70 per cent $WO_3$ were produced.

In June 1943, the U. S. Geological Survey and the U. S. Bureau of Mines came in to sample, drill and map the district and continued their work through the first few months of ownership of the property by the Haile company. When the Haile people took over they were urged to build a mill immediately but an unexpected change in government policy effected a withdrawal of all support on priorities for equipment and it became impossible to obtain preferred types of machinery. In June 1945 the Tungsten Mining Corp. was formed by Haile Mines, Inc., and the General Electric Co. The new organization took over General Electric's Miller mine in Idaho, now under bond and lease to the Bradley Mining Co. and the General Electric Las Guijas tungsten property in Arizona. Haile Mines, Inc., is a 70 per cent owner

of the Tungsten Mining Corp. and General Electric owns 30 per cent.

Since the formation of the Tungsten Mining Corp., General Electric has loaned $450,000 to the company and Haile Mines, Inc., has put in additional amounts. A total of over $3,000,000 including $2,000,000 plowed back income from operations has been spent in developing the property.

In the last fiscal year alone ending June 30, 1948, approximately $600,000 has been spent on a development program that has resulted in indicating 450,000 tons of 1.1 per cent $WO_3$ ore —enough for five years of operation. From this tonnage 400,000 units are recoverable. But the price fall, from $33 per unit in July 1947 to $24.25 at mid-July 1948, already has depreciated the value of these reserves in the amount of $3,500,000. Hence the margin of profit has been so reduced as to discourage further capital outlay for development and to confine present production to higher grade areas.

## General Geology

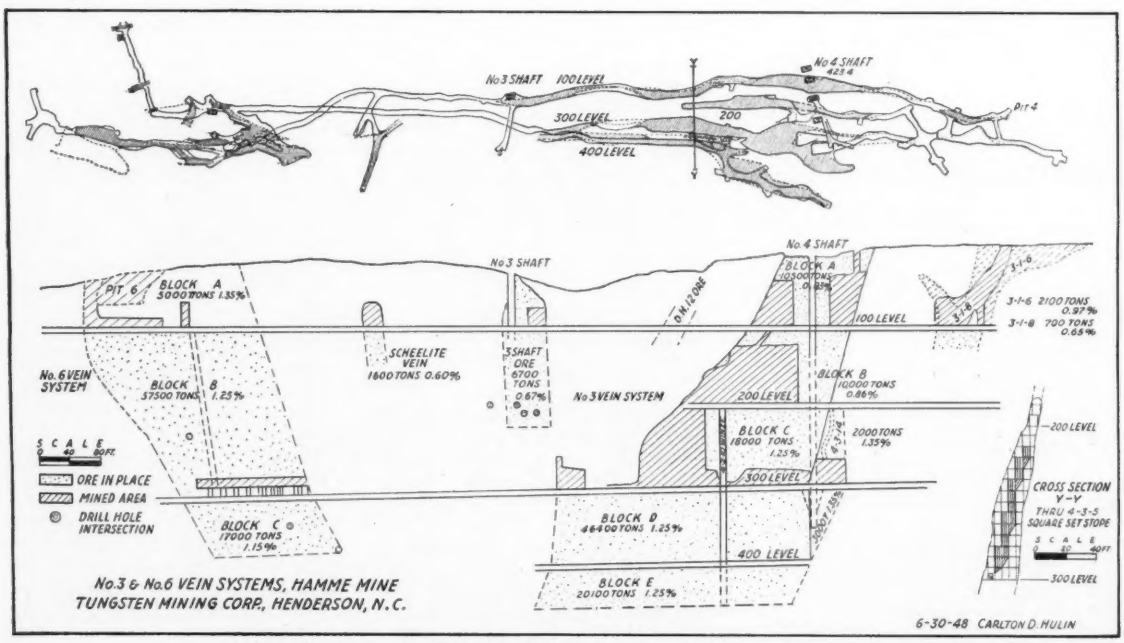
A northeast trending belt about eight miles long and a mile wide cutting across the Virginia-North Carolina line between Vance County, N. C., and Mecklenburg County, Va., contains the tungsten deposit. The center of present mining of the deposit is approximately 3½ miles northwest of Townsville, N. C. Although the first report of tungsten minerals in the area was made in 1901 by J. H. Pratt, in North Carolina Geological Survey Economic Paper No. 4, the deposit laid untouched until rediscovery by the Hamme brothers in 1942.

Ore is trucked to 300-ton mill from several operating shafts

The district lies in the Piedmont Province about 50 miles west of the coastal plain in a region of gentle relief with elevations ranging from about 250 ft to a little over 400 ft above sea level. There are few outcrops because the region has undergone thorough weathering. Float had been used to fence fields and a large tonnage of float has been milled.

Granite and schist are the principal rocks. A sheared zone near the central part of the district extends into the granite mass for more than two miles in N 35 E direction from the center of a curve of the contact. The sheared zone is frequently 50-150 ft in width. The tungsten deposits located in quartz veins occur principally in the granite within one-half mile of the granite-schist contact. A belt nearly parallel to the contact contains almost all of the veins. Most of the known veins are within a small area two miles long near the center of the district and lie in or near a zone of sheared granite near the contact. The majority of the known mineable bodies average from 0.5 to 1.0 per cent $WO_3$, although in rich localized areas large tonnages assaying several per cent $WO_3$ have been found.

In addition to huebnerite, other minerals including pyrite, tetrahedrite, galena, sphalerite, chalcopyrite and scheelite are found. Quartz is the principal gangue mineral in the vein and is frequently accompanied by fluorite, sericite and rhodochrosite. Huebnerite is found typically in the quartz veins in irregular masses or concentrations of crystals. Scheelite is most commonly associated with the




Indicated reserves are sufficient for five years' operation at present production rate

Surface cave reveals square set stoping in wide orebody

huebnerite and comprises about 8 per cent of the total tungsten content.

In the period June 1943 to December 1943 the Bureau of Mines diamond drilled over 7000 ft in 41 different holes and did considerable hand and bulldozer trenching. The results obtained indicated that development and operation of the deposit was warranted. Since acquisition of the property by Haile Mines, Inc., and later under the Tungsten Mining Corp., considerable development and exploration work has been carried on. The veins are expected to persist in depth.

## Mine Planned for Immediate Production

In order to realize early production of $WO_3$ to serve the great needs of industry during the war period every effort was made by the operators to get into immediate production. A number of veins were simultaneously attacked in order to develop as many working places as possible for production at the earliest date. Since that time some of these shafts have been abandoned and plans are now going forward for a well-laid-out productive mine. The principal production is coming from the No. 4 shaft and the Sneed shaft. A shrinkage stope in the workings of the No. 2 shaft is being cleaned up and the ore milled. The No. 4 shaft on the No. 3 Walker vein is an inclined shaft which leaves the vein structure at a point above the 300 level. This shaft was raised from the 300 level which had been previously opened up through a winze. The 400 level is accessible from this inclined winze which connects the second, third and fourth levels. An excellent ore shoot lying close to the shaft station at the 300 level has a maximum stope width of 42 ft and is about 280 ft in length. Estimated reserves in this block of ore between the second and third levels are about 20,000 tons.

Stoping operations on this width are conducted by conventional square setting. Sill sets are 8½ ft high, on 5-ft centers using 8 by 8-in. white and red oak. Chutes are placed on 15-ft centers for extraction.

Backs are drilled out with IR R58 stopers and broken ore is hand mucked into chutes with spar forks and No. 5 scoops. Where conditions are suitable, shrinkage stoping is employed usually leaving a 12-ft drift pillar above the level. All drifting and cross cutting is done with a burn cut. A DJM, 7-ft, IR jumbo mounting two IR DA30 drifters has been found to give good results in speeding up advance.

## Drilling Practice Based on Insert Bits

Almost all drilling is done with Carsets bits on alloy steel rods. Each miner is supplied with five bits per day which are turned in for daily inspection and touched up if necessary. In most instances miners use 2⅛-in. diam series 13 jackbits for drilling the blank burn cut holes.

Through the month of June 1948, 2200 bits had been used and the following drilling results are typical.

| Month | Average Footage per Bit |
|---|---|
| March | 119 ft |
| April | 108 ft |
| May | 105 ft |
| June | 105 ft |

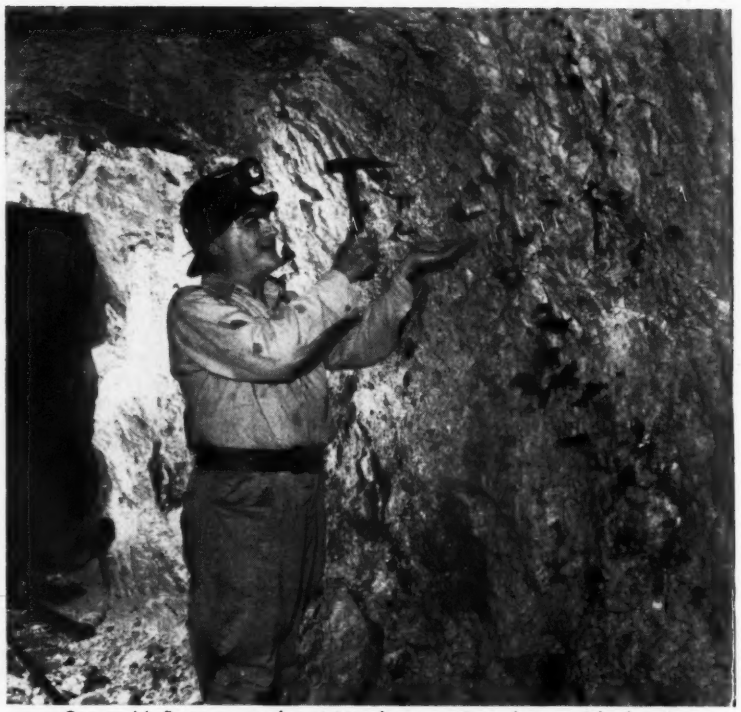
Average bit cost per foot of hole ranges from 9½ to 10¢. For the first six months of 1948, an average of 26,600 ft of drilling per month was done with Carset bits. Inasmuch as frequent power shut-offs interrupt operations, Carset bits have proven to be a form of insurance which almost guarantees freedom from lost rounds due to power failures. All breaking is done with 40 per cent Dupont special dynamite. Fuse is used in the stopes and electric blasting caps on development. Blasting lines are available in most places and a portable shot firer is used when required. All powder and fuse is stored on the surface and the requirements for immediate use are brought into the mine daily.

Mucking is done with both an Eimco and a Sullivan loader, into 16 cu ft mine cars. A track gauge of 24 in. and 20-lb rail is standard throughout the mine. Compressed air is supplied to the working faces through a 3-in. air line on the drifts reduced to 2 in. in the stopes. One inch water lines are used throughout the mine. Electric cap lamps are used entirely.

## Exploration Increased Reserves

In addition to the drilling completed by the Bureau of Mines, an extensive drilling program has been conducted by the company. During the fiscal year 1947 to 1948, 23,900 ft of combined surface and underground diamond drill hole was put down. Surface drilling, done on contract with an AX drill, totaled close to 15,000 ft. Underground drilling is done with an HS-15 Sullivan drill, EX size with an average daily footage of 20 to 30 ft. The exploration program has been eminently successful in indicating sufficient reserves for five years' operation at the current rate.

New central shaft will be equipped for 1000-ft depth



George M. Brown, general superintendent, examines clusters of huebnerite crystals on 400-ft level, No. 4 shaft

Consolidation of mining activities will be realized upon the completion of the plan based on the new central shaft. This 6 ft 4 in. by 15 ft 10 in. shaft will have three full compartments 54 in. by 60 in. It is now down 41 ft and the collar is being placed. A steel headframe and hoisting equipment will be installed to equip the shaft for a maximum depth of 1000 ft. The sinking plans call for a 6-in. churn drill hole, 300 ft deep to connect with a cross-cut now being driven on the 300-ft level of the No. 4 shaft. The driving of a small-section raise from the 300-ft level to the bottom of the collared section will be facilitated by use of a hoisting cable operated through the churn drill hole. The shaft will then be slabbed out to full section. The shaft collar will be concreted down to solid rock. The present program calls for sinking the shaft to the 500-ft level in the immediate future.

The new shaft is located between the Nos. 2 and 3 vein systems to enable ready access to the ore reserves that have been proven or indicated by diamond drill and development work. Future plans eventually call for connecting the workings of the Sneed shaft with the central shaft. Timber used in the new central shaft is also locally-cut oak normally supplied at prices ranging from $45 to $50 per thousand. The timber is treated with copper naphthanate as a preservative.

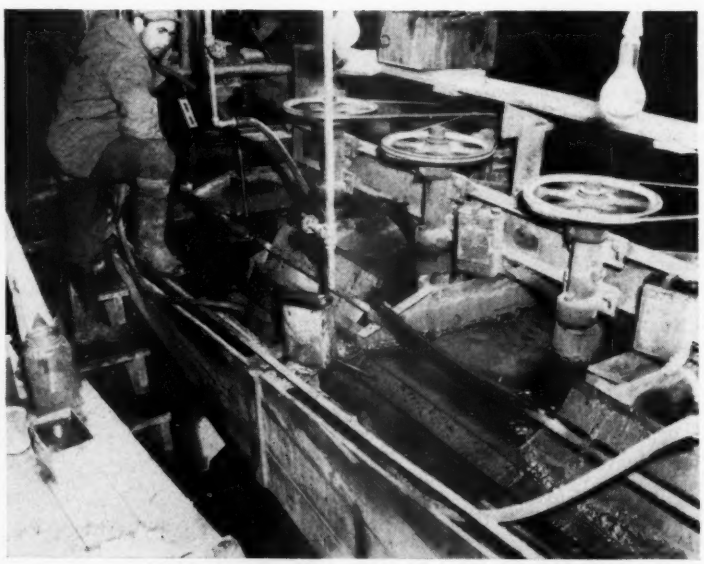
Present production, principally from the Sneed and No. 4 shafts, is hauled to the mill by truck. The bulk of the production comes from five operating stopes and several headings in ore.

## Milling Plant Improved

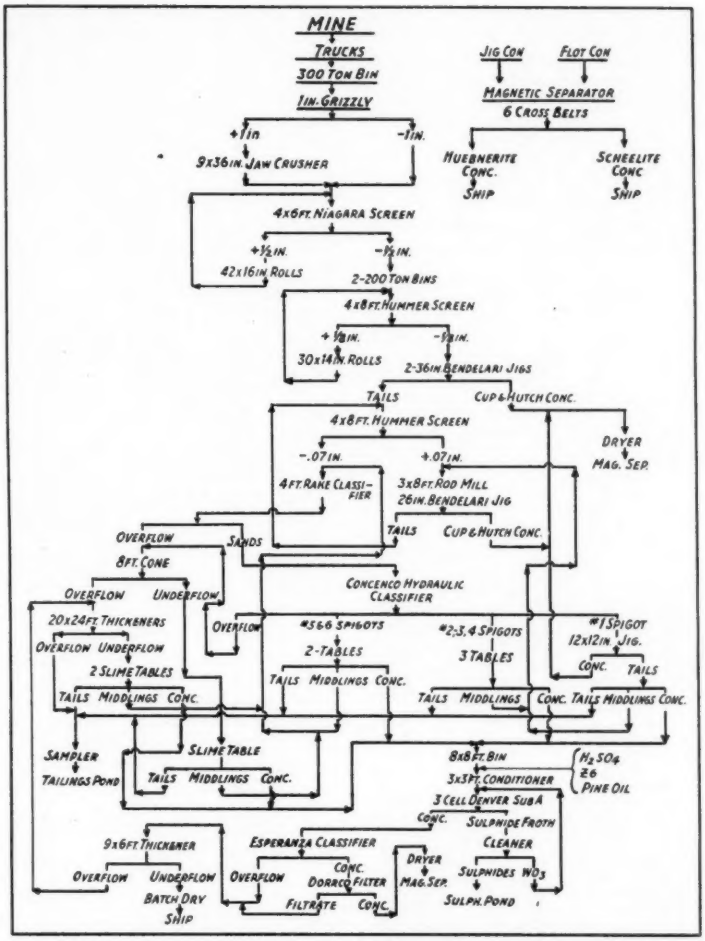
Operations of the new mill at the Hamme Mine began in March 1946 on a designed basis of 200 tons per day capacity. Many difficulties were experienced in obtaining deliveries of suitable milling equipment and some compromises were made resulting in less efficient operations than had been hoped for. Actual mill operations were only possible for about two shifts daily at the outset.

Since operation of the new mill, the open-circuit gyratory crusher has been replaced with a closed-circuit jaw crusher in order to make a better feed for the rolls. An additional 36-in. Bendelari jig has been added to the recovery equipment and thickening capacity has been increased. Numerous flow-sheet alterations have been made to increase efficiency and now the mill has a capacity of 300 tons per day. Current operations of 6000 tons average milled per month are conducted with 85 per cent recovery of the contained $WO_3$. Based on calculated heads, recovery averaged 83 per cent in the fiscal year 1947-1948. Calculated heads during this period were 0.87 per cent $WO_3$ and assay heads were 0.94 per cent. Tails in this period averaged 0.17 per cent $WO_3$. Mill heads last year reflect the milling of a considerable tonnage of development ore.

Slightly more than 58 per cent of the concentrates produced in the fiscal year 1947-1948 were a table product retreated by flotation and totaled 22,175 units $WO_3$. Jig product accounts for almost 42 per cent of the concentrates and totaled 15,973 units $WO_3$. Tailing from tables and flotation are stockpiled separately. Table tails run about 80 per cent quartz. The floated tails product contains sulphide minerals including galena, chalcopyrite, tetrahedrite, sphalerite, and various other sulphides in addition to pyrite with the latter making up the



Flotation removes sulphides from table concentrates




Addition of magnetic separator to flowsheet will up-grade jig and table concentrates

largest percentage. A small quantity of an unidentified silver mineral is also accumulated in the floated product. In 1947-48, 450 tons of sulphide tailings were impounded with an average assay of 0.37 per cent $WO_3$ in addition to contained sulphide minerals.

Installation of a 3 by 8-ft Marcy rod mill was made in mid-July and has met all expectations in increasing mill operating time one hour per day and increasing mill capacity. An indicated one to two per cent increase in recovery may be realized. Placed in the circuit to regrind minus ⅛-in. plus .07-in. jig tailings and secondary middlings from coarse sand tables the rod mill has added considerably to milling efficiency.

A high-intensity, Dings magnetic cross-belt separator has been placed in operation to up-grade dry jig-concentrates and table concentrates after flotation to make a huebnerite product assaying more than 70 per cent $WO_3$, and a scheelite product assaying about 20 per cent $WO_3$.

National production is about 3500 lb daily of flotation concentrates and 3000 lb of jig concentrates which together will average between 55 and 56 per cent $WO_3$. Concentrates are dried in a helical conveyor with infrared light. Sacks of 100-lb weight representing 50 per cent of the primary and all scheelite concentrates are shipped under contract to the National Reconditioning Co., Glen Cove, Long Island for upgrading. The remainder is shipped to the General Electric Co. lamp works in Cleveland, Ohio as super-quality $WO_3$.

A new addition to the mill was completed in June 1948 to house the magnetic separator, work shop, and furnish storage room for supplies. The second floor is used as a mill office. Sacking previously done by hand will be handled in this new addition with two 1-ton electric cable hoists handling 800-lb capacity cans which accumulate magnetic separation products and primary concentrates. Cans will be emptied into a 5-ton concentrate bin from which sacks will be filled.

All mill improvements were made while normal operations were maintained to keep pace with mine production. Since originally started more than 100,000 units of $WO_3$ have been produced up to June 30, 1948.

A crew of 21 men is divided into three shifts for mill operation. Crushing operations alone require the services of three men per shift. Three men are employed in the gravity plant, one in the flotation plant on day shift only, one in the sacking plant on day shift only, and one oiler on the day shift only. A maintenance crew of four men service equipment on the day shift.

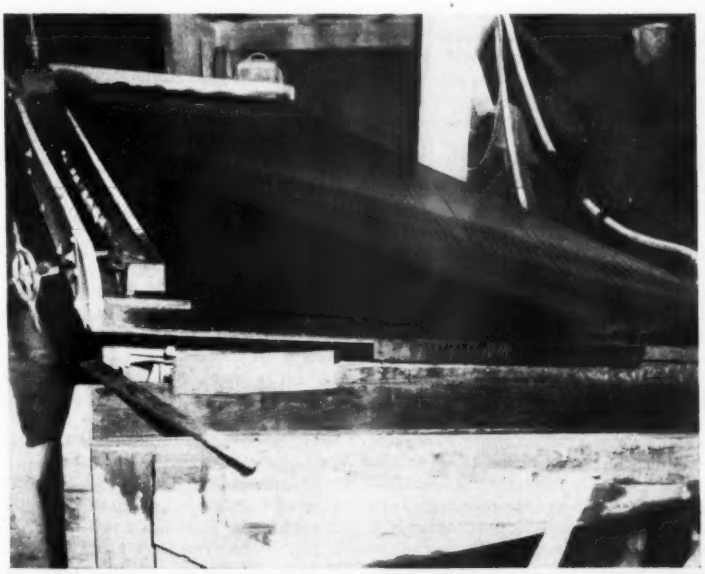


Table concentrates carry associated sulphide minerals in addition to huebnerite and scheelite

## Assaying and Metallurgical Tests Control Mill Operations

Assaying is conducted in an up-to-date laboratory where approximately 18 to 20 samples per day are analyzed for tungsten by a modification of the chinchonine, tannic acid, antipyrene method. Results are turned over to the department concerned on the day following receipt of the sample. Frequent assays are run for Cu, Au, Ag, Zn, S, and Ca. One man is employed in sample preparation and two chemists assist the asayer in analyzing the samples.

Metallurgical tests of a varied nature are run in the assay office to establish mill design data. Screen analyses are run to determine distribution of $WO_3$ in the various mill samples as a basis for determining equipment efficiency.

## Personnel and Housing Problems

Considerable difficulty has been experienced in carrying on operations due to the lack of experienced men for both mining and milling operations. A few qualified miners have been brought in from the outside but the bulk of the men employed in both mine and mill are local and inexperienced. At present about 180 men are in regular employ with 100 to 110 of these underground.

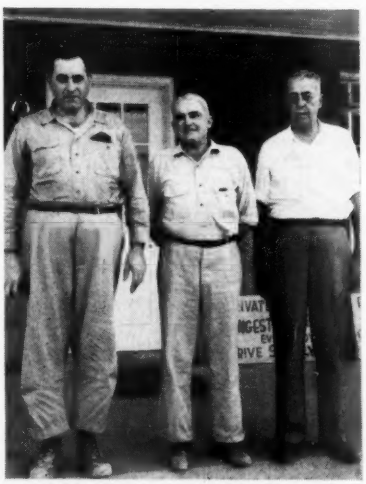
It was found necessary to provide housing for a portion of the personnel and about 58 units are available including some cinder-block houses built for the staff. The bulk of the company houses are built of re-designed war surplus housing. According to size, three to four room houses are supplied to the worker at cost ranging from $5 to $7.50 per month. The balance of the employes live in surrounding towns and a company bus is provided to bring the miners to and from work on regularly scheduled trips.

The miners receive $1.22½¢ per hour base rate on a 48-hour work week basis but can make considerably more on contract work. Average weekly earnings for miners is more than $63. Both white and colored labor is employed underground and in the mill.

An open shop is maintained, although the United Stone and Allied Product Workers, CIO, have enrolled about 60 per cent of the employes.

Presenting a major threat to the life of this important tungsten producer is the proposed Buggs Island Reservoir under construction by the Army Corps of Engineers. Already $18,000,000 has been spent and appropriated to construct the foundation of this dam which will inundate 88,000 acres of land in the near vicinity of the present operations of the Tungsten Mining Corp. This includes a large area to the northeast of the present workings where numerous quartz veins containing huebnerite outcrop. At the flood stage the level of the impounded water will reach the 320-ft above sea level contour which is approximately the same elevation as the 100-ft level of the workings in the No. 4 shaft. Inasmuch as geological information indicates the persistence of the occurrence of these huebnerite-bearing quartz veins to great depths and excellent showings have already been opened up in 500 ft of development on the 400 ft level of the No. 4 shaft, it appears probable that the dam if constructed will prevent the full development of the mine and make practically impossible the recovery of all the commercial ore in the deposit.

It is estimated that the dam is being constructed to eliminate approximately $320,000 annual flood damage to crops in the vicinity. In comparision to the mine's annual average pay roll of $600,000 and also its planned



Frank H. Bishop, vice-president and general manager; George M. Brown, general superintendent; and W. L. Long, vice president and counsel

annual recovery of $2,000,000 in tungsten. It hardly seems wise to endanger a strategic mineral deposit of as yet undertermined extent to eliminate the relatively small damages caused by flood. The preliminary estimate of the sales value of power that may be supplied from the hydroelectric plant to be built in conjunction with the dam has been placed at 11 mills per kw. At present the Tungsten Mining Corp. is purchasing power from the Carolina Power & Light Co. at 9 mills on a demand basis of 600 kw.

The organization of the Tungsten Mining Corp. is made up of the following staff: H. S. West, president; W. L. Long, vice-president and counsel; Frank H. Bishop, vice-president and general manager; George M. Brown, general superintendent; A. O. Wilson, mine superintendent; J. T. Hanvey, Jr., mill superintendent; A. M. Szynklewski, chief engineer; R. F. Whiteside, assayer; R. H. Richmond, assistant mine superintendent; John V. Hamme, assistant mill superintendent; G. V. Boyd, purchasing agent, and Carlton D. Hulin, consulting geologist.

Tungsten is one of industry's most essential metals. Its use in high speed steel tools and tungsten carbide tools and dies has revolutionized mass production of formed heavy metal products. It excels in use for electric contact points, X-ray targets, armour-piercing projectiles and numerous other applications. Its application in incandescent lamps saves untold amounts of fuel in electric power production because of its vastly superior efficiency in producing light.

It is estimated that at least an annual $300,000,000 worth of peace-time products used in our present economy could not be produced without tungsten.

Tungsten is irreplacable based on present-day knowledge in the following esential products:

(1) All radar and television
(2) Tungsten carbide—tools, dies, and wear-resistant parts
(3) Radio transmitting tubes
(4) Proximity fuses
(5) Spark plug posts for B-29's
(6) Gyroscope elements (requiring maximum weight with minimum volume)
(7) Radiation shields for X-ray (requiring maximum shielding with minimum volume)

In war, tungsten is a most strategic metal. Germany pioneered in the use of tungsten, having discovered among other tungsten uses the tungsten carbide material for tools and dies. It has been established with reasonable certainty that Germany's early victories in World War II were in no small part due to her ability to mass produce metal into war machines in which process tungsten tools were used most effectively. It is a known fact that Rommel began to be chased by the Allies only after we started shooting tungsten carbide projectiles into his tanks.

Today Russia is securing most of China's tungsten production which previously was used by the United States. At the same time in the U. S. we are confusing a struggling tungsten industry by reducing tariffs and deferring stock piling, thereby softening tungsten prices to a point where we imperil the domestic supply of this strategic metal. In the case of the Tungsten Mining Corp. the economic situation plus threatened flooding of the mine and submergence of what may be extremely important deposits to the north of existing workings present distinct hazards to the future development and full utilization of this deposit.

Hand shoveling pioneered conveyor mining

# Symposium on CONVEYOR MINING

## The Trend in Thin-Seam Operations Is Away From Hand Shoveling Toward Several Types of Mechanical Loading

IN THE development of coal mine mechanization, the use of conveyors as a loading unit at the face has been largely confined to thin seams. This statement of course has no reference to belt conveyors that have made such a phenomenal growth in the past few years for gathering and mainline haulage in thick as well as thin seams. Conveyors in themselves do not load coal mechanically and in the earlier, or what we might term pioneering, installations made 20 or more years ago, their principal function at the face was to reduce the amount of labor used in hand shoveling—it was much easier for a man to shovel coal onto a conveyor only a few inches high than to throw it for a distance of several feet up and into a mine car. Then, as developments progressed, it was discovered that conveyor mining, through group working, provided better supervision, greater safety, and resulted in indirect savings through the concentration of the mining area and the elimination of gathering haulage.

It has always been the objective to use some form of mechanical loading for conveyors at the face, and over the years, a number of different types of machines have been tried. These developments have followed two lines—self-loaders of which the duck-bill is the outstanding example, and low-height mobile loaders especially designed for thin seams. These machines are continually coming into wider use, although there are many conditions where hand shoveling seems to be, for the time being at least, the preferred method.

In the August MINING CONGRESS JOURNAL, Fred R. Toothman presented an over-all picture of the development of conveyor mining in West Virginia. His account is supplemented by the three discussions in this issue which describe typical conveyor operations in low coal with duckbill, conveyor-loader and with hand shoveling.

## HAND LOADED FACE CONVEYORS

By SAM S. CLARKE

Superintendent
Gauley Mountain Coal Co.

LOW coal, complicated by abrupt changes in height and grade, offers a serious handicap to mechanized mining but these difficulties have been successfully met at the Williams River Mine by hand loading onto conveyors at the face, with a combination of chain conveyors, belts and mine cars for the haulage. This operation is in the recently-opened Gauley field of central West Virginia and mines the Sewell coal. The seam normally is about 42 in. thick and lies fairly level; however, variations frequently occur—heights ranging from 24 to 54 in. and pitches or dips of 10 per cent and greater for short distances. Although these irregularities only affect a small portion of the property, they nevertheless are known to exist and consequently operating methods and equipment are designed to mine them

when encountered. Otherwise, there are no serious mining difficulties. The top usually is good and does not require heavy timbering; water is encountered near the outcrop where cover is light, but drainage has not been a serious problem; the mine so far is non-gassy.

Experience has demonstrated that hand-loaded conveyors are the answer for driving entries and rooms; face conveyors are used in wide work, but in narrow work coal is shoveled directly onto the chain conveyor. In both wide and narrow work, the chain conveyors transport from the face for a relatively short distance to a gathering belt in the entry that collects the coal from all places in the operating panel and takes it to the main line haulage that is operated by track and mine cars. The mine cars are 6-ton capacity. At the belt discharge point there is a side track and switching arrangement whereby the main line locomotive can place a trip of empties and haul away the loads without interference or stopping the belt. This combination system uses each type of haulage equipment where best suited to the physical conditions of of the seam; face conveyors are efficient not only in normal seam thickness, but can also operate when low coal is encountered; belt conveyors are adaptable to the varying heights and grades that may occur on the panel entries and track haulage with mine cars is standard for main line service.

An operating unit consists of six working faces, that may be either entries in the development or rooms in a production panel. Each face is complete in itself, with its own equipment and a crew of three men who work on a continuous cycle performing all the operations of preparation and loading, as well as the dead work of timbering and extending the conveyor. The conventional route of mining is followed—the coal is undercut, drilled, shot with permissible explosive, and hand shoveled onto the conveyor; the seam is comparatively clean and the few impurities in the coal are picked out by the loading crew. Supplies are brought to the face by the chain conveyor in reverse.

Mining is by the room and pillar system retreating, starting at the top of the panel after the entries have reached the inby barrier limit. The rooms, worked in blocks of six, are 40 ft wide with a 15 ft pillar between that is more or less completely recovered by the face crew immediately after the room has been driven up. The recovery is by longitudinal slab cuts hand shoveled directly onto the chain conveyor that, anticipating pillar extraction, is laid close to the rib on the room advance. The chain conveyors extend to the room necks where they load onto the gathering belt conveyor.

In the heading development a cross conveyor is laid through a line of breakthroughs at right angles to the entries; each entry chain conveyor loads onto this and it in turn discharges onto the gathering belt. The cross conveyor is moved ahead at about 300 ft intervals as the development advances and the belt is extended accordingly until it reaches a maximum length of 1500 ft. The entries used for track haulage are brushed either top or bottom to give a uniform grade. The brushing and track extension follows rather closely behind the entry driving; the rock is loaded into mine cars by a scraper hoist.

The electrical and mechanical installation and repairs are made by special maintenance crews who take care of all equipment in a panel. Purchased AC power is converted to 250-v DC by a track-mounted mercury arc rectifier. In the working places power is taken to the face by a three-conductor insulated cable (positive, negative and ground) made sectional to eliminate the fire hazard in reeling or piling. Two sections are 50 ft long and two are 100 ft in length making a total length of 300 ft. Connections to join the cable sections are of the "fire hose type." At each working face there is a junction box from which separate leads are taken to the cutting machine, drill, and face conveyor.

# DUCKBILL MINING

All operations on a continuous cycle

By O. G. SCHWANT
Manager of Operations
Hutchinson Coal Company

THE newest operation of the company is the Melvile Mine, located in Logan County, W. Va. Operations are conducted on that locally. The Eagle Seam has a normal average thickness of about 4 ft. However, variations in seam height occur and the character of the roof is also variable, often requiring cross-bars and close face timbering. But since advance knowledge was had of these conditions apt to be encountered, mining equipment and mining plans were selected to meet them.

In both entry development and room work the room and pillar system of mining with Goodman Power Duckbill Loaders is used. Main entries are driven in sets of fours, each 18 ft wide on 45-ft centers. Room entries are driven in sets of three, 20 ft wide on 45-ft centers. Rooms are on 40-ft centers, started at 18 ft, widening out sharply until a 30-ft width is obtained; they are driven to a depth of 300 ft, the maximum length recommended for the shaker conveyor line.

The well-known conventional type duckbill loader is used at this property. The conveyor drive is 20 hp, weighing about 6 tons; 13-ft pans made of light-weight sheet metal and weighing slightly over 300 lb each are

Presented to the West Virginia Coal Mining Institute, Beckley, W. Va., June 11, 1948.

bolted together and set on ball frames. The duckbill is mounted on a telescopic pan 16 ft long, connected through a swivel to the main shaker line; the loading head is power operated with a double-drum hoist driven by a 2½ hp motor fastened to the end of the pan line. A 7/16-in steel rope passes around the drum down each side of the telescope pan to the head and fastened to jacks on each side of the working place. Through this rope and drum the operator, in loading out the cut, directs the movement of the loading head by push button controls, moving from left to right or vice versa and also extending or retracting the telescope pan. With the diamond-shaped head, the remotest corners of a working place can be cleaned up without any additional manual labor. The duckbill measures 34 ft from the end of the shovel in its retracted position; the complete unit—shaker drive, swivel and duckbill head—completely assembled for operation requires 53 lineal feet for the initial set-up.

Belts transport from shaker to main line

## Operating Cycles Reduce Lost Time

Each working face has a Goodman shortwall cutting machine with a 9-ft bar and a bugduster. The bugduster removes from 75 to 80 per cent of the machine cuttings from under the cut of coal, thus eliminating the need of a machine helper—definitely a beneficial labor-saving device. It likewise reduces the amount of fine coal dust in the air as compared to the older method of hand shoveling the machine cuttings. A Chicago pneumatic drill is used in drilling the coal and DuPont Monobel C is used in blasting.

A dead pan line in each working place brings supplies up to the face. It is dragged forward as the face advances by the cutting machine operating its ropes as a hoist or puller. The supplies consisting of headers, wedges, posts, ball frames, rockdust, etc., are loaded on the dead pan at the room neck by the supply man.

A certified section foreman has charge of two conveyor units with his crew made up of

2 duckbill operators
2 cutting machine operators and drillers
2 duckbill helpers
2 supply men
1 foreman

Three men are used at the face, designated as A, B and C in the following description of a typical cycle.

*First Step:* Working face is inspected by foreman for dangerous top or gas. All three face men remove timbers from dead pan line and set a header at the face using Duff-Norton jacks for support.

*Second Step:* Men A and B pull cutting machine to right rib, set bits, oil chain and sump up. Man C is getting posts ready for timbering.

*Third Step:* A operates the cutting machine leaving B and C to remove screw jacks from under last header after permanent posts have been set thereunder. The rate of cutting is about one minute per foot of face.

*Fourth Step:* A and B drill while C removes any excess machine cuttings from under the kerf.

*Fifth Step:* A, B and C pan up the conveyor to a point where A and B can complete the pan-up while C loads and tamps the holes.

*Sixth Step:* Cut is shot down and the foreman makes an inspection of the roof and face for gas. With the foreman's approval, B and C load coal while A readies the cutting machine, pulls up the dead pan line and starts unloading some supplies. The fall of coal is cleaned up in 30 minutes. Power is supplied to the face equipment by a central power distribution system.

## Conveyor Moves Made Quickly

The room conveyor is extended by adding 13 ft of pan after every second cut. The complete move-up of a unit on an entry is made at every third breakthrough—a distance of 240 ft. Entries however are driven 300 ft to enable the men to make the assembly for the next set-up; as stated before, the initial set up of the drive and duckbill requires 53 lineal feet of space. When the move begins, the duckbill is disconnected, the pan line is taken up and the cutting machine drags the drive to its new position, a distance of 240 ft. This part of the move requires 2½ hours; the complete moving time of two duckbill units is accomplished in 7½ hours. Eight men and a foreman are used to accomplish this.

From three to four falls are cleaned up per shift when roof conditions are not too severe; however, this performance is affected adversely when bad top is encountered. Due to the variation of the seam thicknesses and varying widths of working places to meet different top conditions, no set figure can be named as a representative number of tons per cut. The productions range from 14 tons to 20 tons per cut in the entries and up to 30 tons per fall in the rooms.

The power duckbill in action

# THE CONVEYOR-LOADER

By THOMAS E. GETTINGS
Safety Director
The Lorado Coal Mining Company

IN Logan County near Lorado, W. Va., the company has two operating mines: No. 2 and No. 5, both worked from drift openings. No. 5—the newest mine, opened in September 1945—is working the Chilton seam, that averages 42 in. in height and appears to be quite uniform throughout the area. The seam dips to the northwest and has local dips and rises; the top is of slate and sandrock, and the bottom is a rather soft slate. The coal is of excellent quality, and is considered a good gas and by-product coal; however, draw slate comes down when the coal is mined, making mechanical cleaning necessary. A washing plant now being constructed should soon be in operation.

## New Type Loader Simplifies Operations

For several years conveyors have been in use in low coal in this mine and in September 1947 a Jeffrey Conveyor-Loader was installed at No. 5 Mine to replace hand shoveling. Two machines are now in use—the second was added in April 1948—and at present both are used for room work. This new type loader is specifically designed for thin seams and has incorporated features that provide greater efficiency, economy and safety for the face operations in conveyor mines. As its name implies, the machine is a combination conveyor and mechanical loader—a short chain conveyor with a gathering head at the front end. It works on an entirely new principle; its discharge point is pivotally anchored above the room conveyor onto which it discharges and it loads out all coal from a cut by swinging the head radially across the face. This eliminates any effort on the part of the operator to keep the boom in position over the room conveyor and as a result, he does not have to watch for spillage along the pan line, but can concentrate his attention on loading coal.

The machine is electrically operated with an 18 hp motor, self-tramming, and mounted on four rubber tires. The loading head is at the end of a telescopic conveyor boom having an extension of 12 ft, hydraulically controlled; with the boom retracted the overall length is 23 ft 7 in.; with the boom extended the length is 35 ft 7 in. It is 73 in. wide, 24 in. high with a minimum tramming height of 25 in. A hydraulic swivel jack at the discharge end of the boom keeps it anchored over the conveyor on which it is loading. The rated capacity of 1½ tons per minute in loose coal provides an average loading rate of ⅔ tons per minute including clean-up and necessary digging; the usual tonnage per shift ranges from 140 to 200 tons.

Presented to West Virginia Coal Mining Institute, Beckley, W. Va., June 11, 1948.

## Mining System Facilitates Moving Equipment

The room and pillar system is used with three room entries driven 2500 ft and with working rooms off both sides. Two entries are air intakes and one is the return; the belt line and supply track are in the middle entry. Stoppings are installed between the two intake entries as a safety measure in case of a fire on the belt line. Rooms are 300 ft long, 35 ft wide, on 50 ft centers, leaving a 14 ft pillar; breakthroughs are driven on an angle of 60 deg 16 ft wide, facilitating tramming the machine from one room to another. With rooms kept at a maximum width of 35 ft, a cut of coal can be cleaned up by the conveyor loader swinging across the face without moving its anchorage from one set position.

At present two loaders are operating on double shift, working two rooms each; one off each side of the entries, loading onto pan lines in the rooms that transfer onto a 30 in. belt in the entry. In addition to the one loading machine for two rooms, each room has a cutting machine with a 6½-ft bar and a hand-held drill. A face crew consists of:

1 Loading machine operator
1 Loading machine helper
1 Cutting machine operator
1 Cutting machine helper
1 Shotfirer
2 Timbermen and drillers
1 Supply and clean-up man
1 Foreman

9 Total number of men on the face crew

In addition to the two face crews there is one operator at the loading point of the belt and one mechanic who serves both loading machines. This makes a total of 20 men charged to the two loaders.

Behind the loader, a standard method of permanent timbering has been adopted by setting posts on 4-ft centers lengthwise and crosswise of the room. The permanent timbers are brought up in the form of a "V," the point of the "V" being at the tail block of the room conveyor. The area where the machine operates ahead of the permanent timbering is taken care of by screw jacks. Five holes are drilled and at present experiments are being conducted with multiple shooting. So far experience indicates that multiple shooting will provide more loose coal, thus eliminating excessive digging by the loader.

As an additional safety precaution sufficient self-rescuers for every man are being placed in each room section. The men are not required to wear the rescuers but the equipment is placed in a box kept at the next to the last breakthrough. A small face rockdusting machine is being installed on each section to insure adequate room dusting.

The loader is a complete mobile unit

## Operation of Machine

After the coal has been shot down, the loader is trammed into the room coming to its loading position with the gathering head at the coal line and the discharge end overlapping the room chain conveyor. The hinged hydraulic roof jack at the right rear is dropped and wedged between floor

Tractor loaders and shuttle cars successfully mine thin seams

and roof to form a pivoting point for the boom. Next, the retractable steering wheels are turned inward so that the loading head will travel in an arc across the room, and the head end is dropped to floor level. Operation is started with the loader angled to the side of the room The telescopic boom is extended forward, crowding the gathering head into the fall until it has loaded out all coal in its path, after which it is withdrawn, angled for the next gathering and the cycle repeated until all the face has been cleaned up. Temporary roof jacks used at the face for safety posts are moved by the operator and helper during the loading operation. Only a small amount of shoveling by hand is necessary with a well-trained operator and helper. The room conveyor transfers to a gathering belt, 30 in. wide that discharges into steel mine cars of the rotary dump type having a capacity of three tons.

## Summary

One of the most frequent questions asked by operating men, interested in this application is: "Will it work in bad top?" The answer, of course, requires that some understanding must be reached as to what and when is to top considered bad. Since this is an extensive and complicated subject in itself, no attempt will be made here to define roof quality to the extent of reaching a specific decision on the application of the loading machine. Ever since mechanical loaders were first introduced to coal mining, the roof characteristics under which the equipment operates has been one of the principal controlling factors on the results obtained. Experience at these mines reveals that the new loader, under varying degrees of unfavorable roof, presents about the same problems consistent with other type loaders and the degree of efficiency is also similarly affected. Top conditions in these mines are not considered good. It is necessary to timber close, and considerable time is used in setting and resetting safety jacks as it is important that the roof be tested thoroughly before removing any safety jack. This, of course, cuts down loading time. Up until the middle of March an average of 14.76 tons per man shift was produced.

Reports received from other companies indicate that bad top has affected their productive output. One company operating in the Hazard No. 4 coal seam, average height 36 in., top extremely tender slate, with an eight-man crew, is averaging 12½ to 15 tons per man shift. Another mine, working the No. 2 Elkhorn Seam, 42-in. thickness, top and bottom good, with a nine-man crew, is averaging 24 tons per man shift. A third company in the No. 1 Elkhorn Seam, average height 53 in., top and bottom conditions good, with a total crew of 11 men, is averaging 18 tons per man shift.

As in all mines using mechanical loading equipment the principal problem connected with the operation of this machine is the maintaining of well-organized and trained crews. The equipment requires highly skilled operators and extremely good teamwork in following the operation cycle. Since maximum results are dependent upon well-organized and trained crews, close supervision of a high caliber is required. This is a definite problem at the present time but experience with the new loader to date is favorable enough to warrant expectations of improvements in productive output in the future.

## Coal Division Committees American Mining Congress

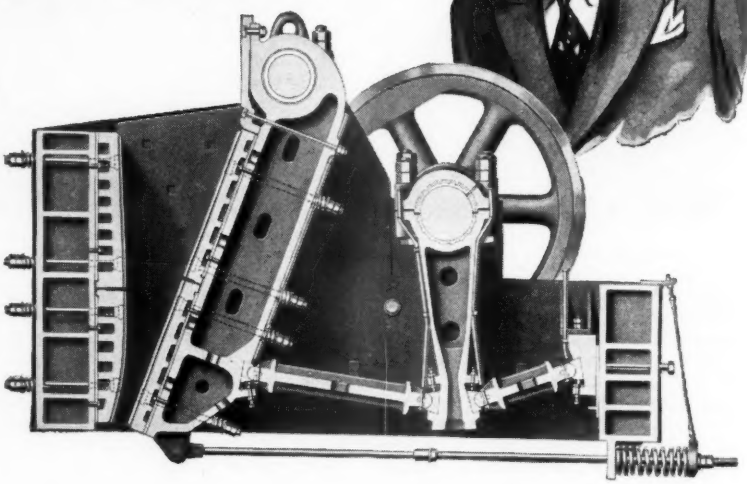
***General Conference at Summit Hotel, Uniontown, Pa. Tuesday, November 9, 1948***

THE Annal Conference of the Coal Division Committees will be held at the Summit Hotel, Uniontown, Pa., Tuesday, November 9. This is an open meeting and all coal operators and equipment manufacturers, whether or not members of the Committees, are cordially invited to come and take part in the discussions.

The Conference will be for one day only, starting at 10 a.m., continuing with a business luncheon at noon, and concluding with an afternoon session. Each committee will present its report for approval or criticism and everyone will have the opportunity to state his own views and offer suggestions.

Subjects of maximum importance to the industry are being studied by the committees—belt and rail haulage, track and off-track mechanical loading, continuous mining, surface preparation, accident prevention, underground power, and pillar recovery.

# Take a NEW LOOK at Jaw Crushers...



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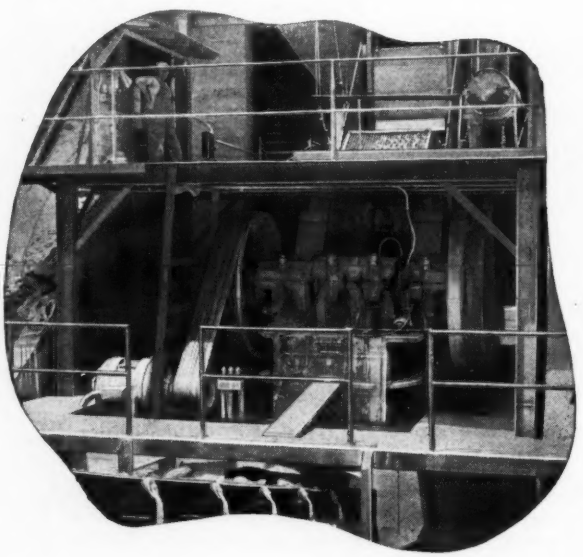

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Another way you can learn about jaw crusher value — watch an *A-1 crusher* in operation! Notice that the largest piece that can enter the jaw opening is effectively nipped. Reduced slippage results in longer jaw plate life.

There's no packing or choking — because crushing is uniformly distributed throughout entire depth of crushing chamber. Built in four sizes, with receiving openings 36 by 25 to 60 by 48 in. Write today for *A-1 Jaw Crusher* Bulletin 07B6369A. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

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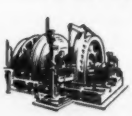
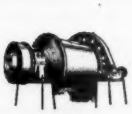
Gyratory Crushers


Hoists

Vibrating Screens


Mills

Kilns, Coolers and Dryers

. . . and Other Equipment for the Crushing, Cement and Mining Industries

# WHEELS OF GOVERNMENT

### As Viewed by A. W. DICKINSON of the American Mining Congress

AS anticipated, the special session of the Congress called for July 26 was short; it lasted 13 days, adjourning on the night of August 7. In the Senate the greater part of the session was consumed in debate on a motion to bring up the anti-poll tax bill. When the motion to adjourn until December 31, 1948, brought the session to a close, the Congress had authorized a $65,000,000 loan to the United Nations, passed an inflation control measure, and approved limited Federal aid for low-cost housing. The remainder of the program contained in the President's message of July 27, including anti-poll tax legislation, revival of the excess profits tax, standby rationing authority, price, allocation and wage controls, and minimum wage and social security benefits increases, was either rejected or ignored.

## Anti-Inflation

The Anti-Inflation Act, which has now become law, authorizes the Federal Reserve Board to restore controls on installment buying until June 30, 1949; under its administration, down payments of one-third of the price of automobiles, refrigerators, stoves, etc., are now being required, with from 12 to 18 months in which to pay the balance. The Federal Reserve Board is also authorized to increase reserve requirements of member banks of the Federal Reserve System by 4 per cent on demand deposits and 1½ per cent on time deposits. The Senate Committee on Banking and Currency removed from the bill the House provision to require the 12 Federal Reserve District Banks to hold gold reserves equal to 40 per cent of Federal Reserve notes issued and 35 per cent of the deposits placed with them by member banks. It will be remembered that in 1945 Congress reduced the gold reserve requirements to 25 per cent for notes and deposits alike, from the previous 40 per cent and 35 per cent levels.

In placing his signature on the bill the President charged that what Congress had done is a "feeble compromise" and that the Congress failed to discharge the task for which he called it into special session. The White House criticism brought the prompt retort from Senator Taft of Ohio that the Administration "now has every power to prevent inflation, except price control, and if price control is ever accepted in time of peace, it will mean the end of economic freedom in the United States." As remedies for inflation, Taft called for reduction in Government spending, limiting exports from the United States, limiting expansion of bank credit and creation of more currency, and directing the buying of goods for European relief "in such a way as not to encourage increases in price."

## Tax

When the President in his special session message proposed reimposition of an excess profits tax, Senator Millikin (Rep., Colo.), Chairman of the Finance Committee, immediately declared, "In my judgment, there is not a chance for an excess profits tax. Such a tax would shut off an essential source of capital necessary for production. Therefore an excess profits tax would lessen production and increase shortages and prices."

In the field of excise taxes Millikin has forecast a cut for next year. The revenue from excises is now $7,500,000,000 annually. Ways and Means Committee Chairman Knutson (Rep., Minn.) has stated that he will not recommend repeal of the great mass of excise taxes, leaving the bulk of the Federal revenue to be derived from the income tax, but that he will go along with reductions in excises where the rates now current are causing a resistance to the purchase of articles.

Knutson is reported to be in favor of further technical changes in the general tax law, which may involve tax reductions of as much as $800,000,000. He has stated that in 1950 the country will be due for another income tax cut.

It is anticipated that following the November election the Committee on Ways and Means will work on the administrative provisions bill of which Mr. Knutson speaks. Representatives of the American Mining Congress Tax Committee will confer with the staff of the Joint Committee on Internal Revenue Taxation in October, with a view to considering further certain technical amendments which are essential to provide incentive for risk investments in mining enterprises. These amendments were previously discussed with Chairman Knutson and the staff in April.

## Extend Copper Import Tax

During the special session Representative James T. Patterson (Rep., Conn.) introduced a bill to further suspend the import-excise tax on copper to March 31, 1949. Patterson declares his intention of reintroducing this bill in the 81st Congress, when he intends to press for immediate consideration.

In this connection, Senator George

### Washington Highlights

**CONGRESS:** Adjourned August 7 to December 31.
**ANTI-INFLATION:** Conservative law enacted
**TAX:** Early action on technical bill
**COPPER:** Import tax suspension to 1952?
**STEEL:** Allocations for mining
**NONFERROUS METALS:** Allocations?
**BASING POINT:** Senate hearings November 15
**MANPOWER:** Draft deferments
**TAFT-HARTLEY:** Act upheld
**UMWA:** Union shop to Courts

W. Malone of Nevada has announced his intention to strive for the enactment of his flexible import fee bill. This measure would reconstitute the U. S. Tariff Commission as a Foreign Trade Authority, vested with power and responsibility to administer trade agreements already in effect. It also directs the Authority to cancel (as of the earliest date possible) all existing agreements without, however, making changes in the import duties established by those agreements. The bill delegates to the Authority the responsibility for administering a system of flexible import duties and the right to prescribe changes in import duties, to provide fair and reasonable competition between domestic articles and like or similar foreign articles. In prescribing such changes in import duties the Authority is not limited as to the percentage of change and is permitted to add articles to or remove articles from the free list, and to establish specific duties or ad valorem duties based either upon foreign value or upon United States value.

Senator Malone states that his bill sets forth guides and criteria for determining what represents fair and reasonable competition. He declares that, "Under such a system, if the standard of living and the level of costs abroad increase, our import fee would be correspondingly reduced; if foreign nations exploit their labor and dump low-price products in the United States, our rates would be increased." He further states that the bill removes from Congress the responsibility for studying and deliberating over the thousands of individual tariff rates, but retains for Congress the right to disapprove by concurrent resolution any unwise use which might conceivably be made of this delegated authority.

## Steel Allocations

The Office of Industry Cooperation in the Department of Commerce has allocated 2570 tons per month of steel pipe, plates, rails, and sheets for maintenance, repairs, and operating supplies to the anthracite industry and an Industry Task Committee has been appointed by Commerce Secretary Sawyer to apportion the tonnage among anthracite operators.

Representatives of bituminous coal mine operators met on August 24 with the Office of Industry Cooperation to discuss provision of steel products for operation, maintenance and repairs. OIC is expected to appoint an Industry Advisory Committee to meet soon after Labor Day.

Meanwhile, more than 80 manufacturers of mining machinery met with OIC on August 18 and, following appointment of a Mining Machinery Manufacturers Industry Advisory Committee, a task group was appointed to present industry requirements to the Steel Products Industry Committee after review by OIC. The personnel of this task group: H. V. Brown, William E. Goodman, Thomas McNally, A. S. Knoizen, J. H. Fulford, O. H. Johnson, Harvey T. Gracely and Guy V. Woody.

The Department of Interior will soon recommend a steel allocation program to OIC covering requirements for metal and nonmetallic mine operation.

## Allocations—Lead, Copper, Zinc

Commerce Secretary Sawyer has stated that defense stockpile needs of copper, lead, and zinc will make mandatory allocations necessary. He cites annual domestic consumer deficits of copper, 100,000 tons; lead, 124,000 tons; and zinc, 48,000 tons, in addition to undisclosed stockpiling requirements. Sawyer emphasized that the stockpiling and military purpose programs must be carried out, although they will have a substantial impact on the already unbalanced metals situation. Manufacturers are known to have suggested a plan to the Munitions Board under which principal importers of critical materials might obtain percentages in excess of their normal requirements to be applied to the stockpiles.

## Basing Point

The Capehart (Rep., Ind.) Interstate and Foreign Commerce subcommittee on Trade Policies has scheduled hearings for November 15 on the problems which have arisen following the U. S. Supreme Court decision of April 26, outlawing the basing point system. A 41-member Advisory Council has been appointed to study the effects of the Court's decision, under the Chairmanship of Melvin T. Copeland, Harvard School of Business Administration.

Senator Capehart states that the Cement case ruling "prohibits absorption of freight costs by producers as a means of meeting competition with plants located closer to the consumer, and applying uniform prices to all purchases regardless of distance from the point of production."

The multiple basing point system is defined by the Federal Trade Commission as an arrangement by which prices, including freight charges, are set at certain agreed-on places, rather than actual shipping points.

## Manpower

The Selective Service Regulations under the new military draft law provide Class II-A deferments for men employed in occupations considered necessary to the maintenance of the national health, safety, or interest only when all of the following conditions exist: "(1) The registrant is, or but for a seasonal or temporary interruption would be, engaged in such activity; (2) the registrant cannot be replaced because of a shortage of persons within his qualifications or skill in such activity; and (3) the removal of the registrant would cause a material loss of effectiveness in such activity." It is also set forth that the President may, from time to time, (1) designate special categories of occupation, employment, or activity essential to the national health, safety, or interest; and (2) prescribe regulations governing the deferment of individual registrants engaged in such occupations, employments, or activities.

Future regulations may or may not contain provision for deferment of draftees by industries or by classifications within those industries. Conferences are in progress between officials of the Selective Service; Manpower Division of the National Security Resources Board; U. S. Employment Service, and U. S. Navy to determine further procedure on deferments on an individual basis of men employed in industry. It has been brought to the attention of these officials that there is a shortage of manpower in the nonferrous metal mines and that there are shortages of the products of such mines. It has been explained to them that the drafting of employes of the metal mines in World War II was a serious mistake, and that little was accomplished by the later withdrawal of men from the armed forces for employment in the metal mines.

Apparently, as before, the local draft boards will have the final decisions. Hence it will be well for those in charge of mining operations to confer with their local draft boards, explain the necessity for deferment of men of draft age in the various labor classifications, and ask that the local draft boards transmit this information to the headquarters of the Selective Service.

Assurances have been given by the Displaced Persons Act Commission that the bringing in of miners will be recognized under the regulations now in preparation. Commission Chairman Ugo Carusi, former Commissioner of Immigration, will leave for Europe on Labor Day to initiate the selection of persons to be brought to the United States under the Act. As yet it is not clear as to the number of miners who may be brought in, but the Commission does state that it will be necessary for anyone employing them to provide transportation from the U. S. port of debarkation to the mining communities. Companies needing men should communicate directly with the Displaced Persons Act Commission, % Department of State, Washington, D. C., advising Chairman Carusi the

(*Continued on page* 103)

# Personals

**John E. Bradburn,** Bureau of Mines Coal Mine Inspector, has been honored for performing an act of valor over and above the call of duty in a mine rescue operation in a Kentucky coal mine. Mr. Bradburn displayed courage and deliberate reasoning under extremely dangerous circumstances, probably saving his own life and the lives of three co-workers and six miners trapped in the Belva No. 1 mine in Bell County, Ky., following an explosion in December 1945.

**G. Donald Emigh,** formerly mining engineer and geologist of the U. S. Vanadium Corp., has accepted the position of manager of the eastern district of the Western-Knapp Engineering Co., with headquarters at room 750, 50 Church Street, New York 7, N. Y.

**R. E. Howe,** president of the Appalachian Coals, Inc., for the past 11 years, announced his election to the position of chairman of the board of directors and announced that **Julian E. Tobey** was elected president of the Appalachian Coals, Inc. as of August 16.

**Paul Queneau** has been appointed metallurgical engineer of the International Nickel Co. of Canada, Ltd., and subsidiaries, according to an announcement by Robert C. Stanley, chairman and president of the company. In his new post Mr. Queneau will be located in New York City.

**Eugene K. Graham** has been named assistant to the general superintendent of the Tennessee Coal, Iron & Railroad Company's Fairfield steel works, **James C. Gray** has been promoted to assistant manager of raw materials, and **Ellwood B. Nelson** has been advanced to general superintendent of the coal mines division.

**John Kirkman "Jack" Berry** has joined the staff of Consolidation Coal Co. (Ky.) as production engineer. Mr. Berry comes to Consolidation from Island Creek Coal Co. of Holden, W. Va., where he was head of industrial engineering.

**L. J. Randall,** Wallace, Idaho, has been named comptroller of the Hecla Mining Co. in charge of tax adjustments, succeeding the late Leo J. Hoban. **L. S. Eddins** has been appointed office manager, succeeding **Bert Woolridge,** who retired September 1.

**Hubert E. Howard, Sr.,** has been elected chairman of the board of the Binkley Coal Co. and Pyramid Coal Corp., and **Rantz E. Snoberger** has been elected president of these organizations according to a recent announcement made by the board of directors.

**Dr. Warren E. Wilson,** hydraulic engineering authority and educator, was appointed president of the South Dakota School of Mines and Technology to succeed the late Dr. Joseph T. Connelly. Dr. Wilson has taught at Tulane and Wayne University and at the Colorado School of Mines and has conducted research in hydraulics as applied to mining and metallurgy.

**William J. Fene** has been appointed as assistant chief of the health and safety division of the U. S. Bureau of Mines, and **Marling J. Ankeny** has been appointed chief of the coal mine inspection branch, according to an announcement made by James Boyd, director.

**F. Gray Weller** joined the staff of the Clyde E. Speer Coal Co. as sales engineer.

**Col. F. W. Fruitman** of Bisbee, Ariz., was recently named honorary officer of the military division of the Most Excellent Order of the British Empire. Col. Fruitman had been in charge of mining and metallurgical operations in the fabrication of metals in the western zone of occupied Germany.

**Ward Ballmer** has been named to the post of director of the public relations department recently set up by the Chino Mines Division, Kennecott Copper Corp., operating in Santa Rita and Hurley, N. M.

**H. A. Cassell** has been named superintendent of the Itmann mine, Pocahontas Fuel Co., Inc., Itmann, W. Va. **Charles Stephenson** succeeds Mr. Cassell as superintendent of the Pocahontas Corp.'s mine at Bishop, Va.

**Robert K. Matheson,** general superintendent of the Cordero Mining Co., McDermitt, Nev., is on leave of absence to direct diamond-drilling operations on the Goleta property at Mono Lake, Calif., for Ira B. Joralemon and associates.

**D. A. Thomas,** president, Boothton Coal Mining Co., Boothton, Ala., has been elected to the board of directors of Bituminous Coal Research, Inc.

**Thomas F. Kearns** has succeeded the late David F. Keith as president of Silver King Coalition Mines Co. **David F. Keith, Jr.,** has been elected a director.

**William Loach,** formerly vice-president of the Wolf Tongue Mining Co. is now manager of the Mining Division of the Firth Steel Corp. **W. J. Loach** has been appointed manager of carbide development and quality control, according to an announcement by J. W. Kinnear, Jr., executive vice-president of the Firth Sterling Steel & Carbide Corp. at McKeesport, Pa. Other major personnel changes include the appointment of **Charles W. Iams, Jr.,** as manager of carbide production and fabrication; **E. G. Moffat** as works manager of the corporation's recently completed plant at Milford, Conn., and **A. B. Vestall** as superintendent of plant engineering at McKeesport. **L. G. Firth,** in addition to his duties as president of the corporation, is accepting the office of director of technical development.

William Loach

**Alwin F. Franz** was elected a director of the Colorado Fuel & Iron Corp. at the July meeting of the board of directors. For several years Mr. Franz has been vice-president in charge of operations for the Colorado Fuel & Iron Corp. and subsidiary companies.

**Wallace D. Barlow** formerly with Rhodesian Congo Border Concessions of N'Changa, N. Rhodesia—later with WPB and most recently with U. S. Bureau of Mines, has joined the professional staff of the Interior and Insular Affairs Committee of the Senate and is assigned to the subcommittee on National Resources, of which Senator Malone of Nevada is chairman.

**Raymond S. Ehrman** has joined the Clyde E. Speer Coal Co., Pittsburgh, Pa., in the capacity of comptroller.

**Walter C. Bennett** marked the 50th anniversary of his entrance in the copper industry during the last week of May. In 1898, at the age of 15, he joined the services of the Nichols Copper Co. as an office boy at $4 per week. Today, Mr. Bennett is president of the Phelps Dodge Refining Corp., a position that he has held since 1938. Only in the United States could this truly American story of progress be realized. Mr. Bennett's many friends join to wish him many more active years in the copper industry.

**Fred C. Foy** has accepted an appointment as vice-president and manager of the sales department, central staff, **Koppers Company, Inc.**

**Charles L. Knaus**, formerly deputy state mine inspector for New Mexico, is now connected with George S. Thompson Co., Inc., El Paso, Tex.

**Eugene M. Thomas**, dean of engineering of the College of Mines and Metallurgy of the University of Texas at El Paso, Texas, was appointed interim president until a successor is chosen to **Dr. D. M. Wiggins**, president, who has resigned to become president of Texas Technological College at Lubbock, Texas.

**A. B. Foulger**, general manager, Lion Coal Corp., Salt Lake City, past president of the Utah Coal Operators Association, has been elected to the board of directors of Bituminous Coal Research, Inc.

**Thomas L. Carey** has been promoted from face boss to the position of safety engineer, Potash Company of America, Carlsbad, N. M. He succeeds **James Edmonds**, who advanced to the post of mine development engineer.

**Robert Gross**, superintendent of the Douglas iron mine, of the M. A. Hanna Co., Chisholm, Minn., has been transferred to the Mississippi group iron mines at Keewatin, Minn., as superintendent. These properties are on the Mesabi range. **Leo Kruse**, superintendent of the Spring Valley operations in Fillmore county, Minn., is now superintendent of the Douglas iron mine.

**H. D. Pinkney**, superintendent, Morley mine, Colorado Fuel & Iron Co., Morley, Colo., is now in charge of the company's Frederick mine at Valdez. He succeeds **Murray M. Watson.** Under the supervision of Mr. Pinkney, the Morley unit was the first in the United States to receive a perfect report from the Bureau of Mines inspection service.

**David H. Ackerman**, formerly of the Benson mine of Jones & Laughlin Steel Corp., at Star Lake, N. Y., is now located with the company's geological department at Ishpeming, Mich.

**Hans A. Vogelstein**, secretary of the American Metal Co., Ltd., has been elected a director of the company.

**A. F. Castanoli** has announced his resignation from Robinson & Robinsin, Engineers, Charleston, W. Va., to join with **John Amos** in the formation of an independent coal engineering company, Castanoli and Amos, with headquarters in Huntington and Mt. Hope, W. Va.

Mr. Castanoli was for many years technical engineer for Pocahontas Fuel and Koppers. His most recent position was chief preparation engineer of Robinson & Robinson.

## —*Obituaries*—

**John Dickenson Littlepage**, 53, long a prominent Alaskan mining engineer, and until recently manager of the Chicagof Mines on Chicagof Islands, Alaska, died at his Seattle, Wash., home in July. He had been prominently associated with leading mines of Alaska since 1914.

**Frederick A. Stevenson**, former president of American Car and Foundry Co., who retired from active service in May 1947, died at the age of 68 years on July 29. Mr. Stevenson had been associated with ACF for more than 40 years.

**Dr. Edward P. Mathewson**, internationally known metallurgist, died at his home in Tucson, Ariz., on July 13. For a number of years Dr. Mathewson had served as professor of the administration of mineral industries at the University of Arizona and as metallurgist of the Arizona Bureau of Mines.

Born in Montreal, Canada, in 1864, Dr. Mathewson received his degree of Bachelor of Applied Science from McGee University in 1885. For a short period of time he worked with the Dominion's geological survey, then became night assayer for the Pueblo Smelting and Refining Co., Pueblo, Colo. Four years after his graduation from McGill he became superintendent and chief metallurgist of the plant. In later years Mathewson's professional work took him to India, Burma, Japan, British Columbia, Peru, and finally, in the fall of 1927, to Arizona as a professor at the university. He served as president of the American Institute of Mining and Metallurgical Engineers in 1923.

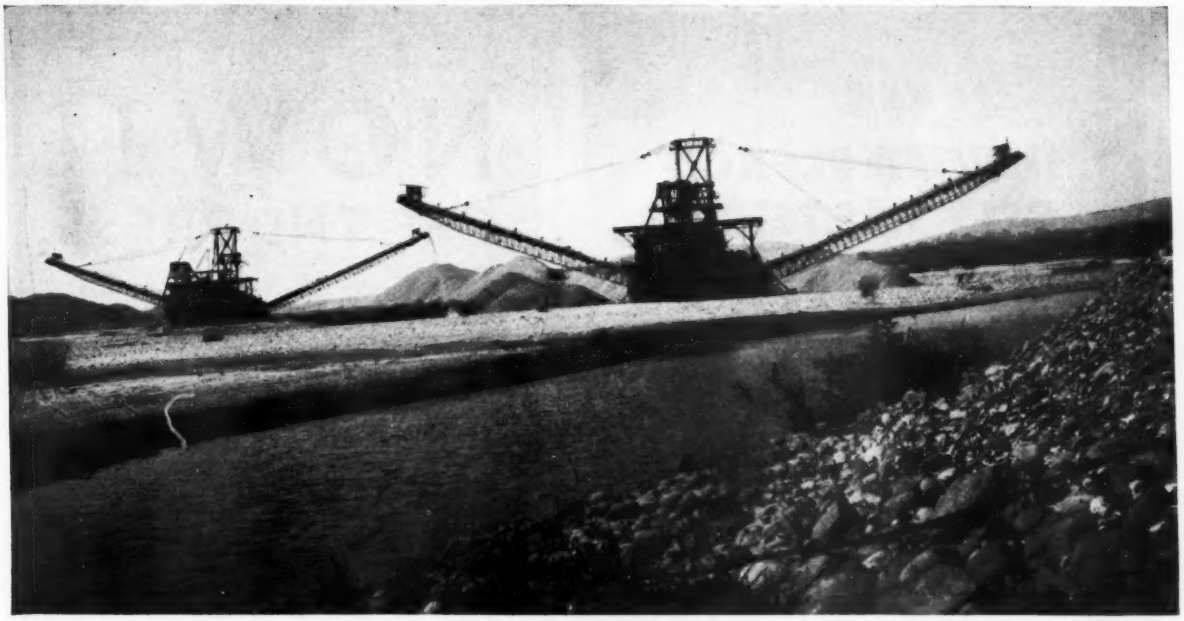
**Walter Luis DuMoulin**, former general superintendent of the New Cornelia Copper Co. at Ajo, Ariz., died at his home in Silver City, N. M., on July 20.

Mr. DuMoulin was born June 28, 1882, at Joliet, Ill. He studied electrical engineering at the University of Illinois and received his degree of civil engineer from the Rensselaer Polytechnic Institute, Troy, N. Y. Most of his professional life was spent in the Southwest. He had been associated with the Old Dominion Copper Mining Co., the Cananea Consolidated Copper Co. and the New Cornelia Copper Co., serving the later company as assistant general superintendent and later as general superintendent.

**David F. Keith**, 53, Salt Lake City. Utah, president, Silver King Coalition Mines Co., died in July after a lingering illness.

**James E. Hayes**, 75, who retired three years ago as chairman of the board of the New Jersey Zinc Co., died on August 6 in New York City.

Mr. Hayes first joined the New Jersey Zinc Co. as general manager in 1909 and was later named vice-president. In 1926 he was elected to the presidency and on the death of a brother-in-law, Edgar Palmer, he became chairman of the board.



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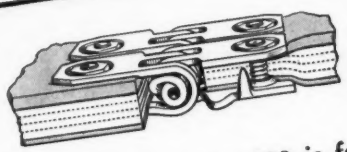

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## Further Activity in Search for New York Iron Ore

The Sprague & Hendwood Co. of Scranton, Pa., is in charge of exploratory drilling in the northern New York area for the Republic Steel Corp. Three diamond drills are now drilling in the Caledonia iron mining area near Possie, in northern Jefferson County, N. Y. Holes are being drilled at a 60-deg angle and may go as deep as 2500 ft to sample the nonmagnetic ore of the deposit.

These mines were worked up until about 40 years ago and shut down when the Mesabi range ores proved to be more economic at that time.

Additional exploratory work is being carried on south of Santa Clara and Franklin County, N. Y., to determine the extent and quality of iron ore deposits in an area located on 21,000 acres of land that Republic Steel Corp has under option from the St. Regis Paper Co.

## Aliquippa Coke Plant Begins Production

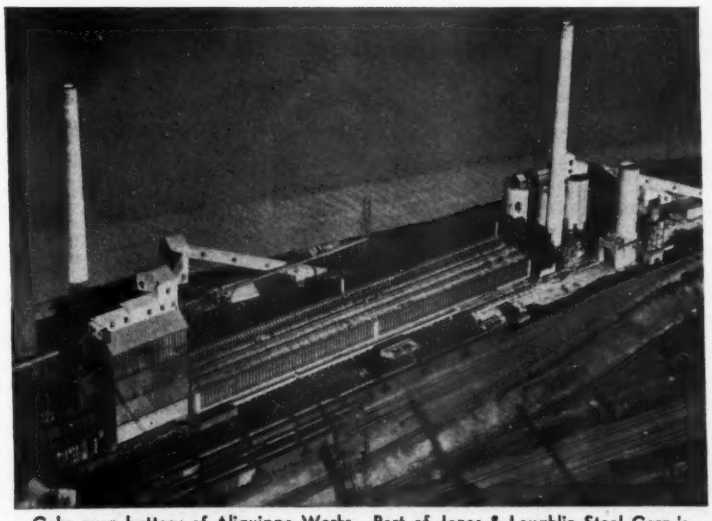
One of the longest batteries of byproduct coke ovens in the world has gone into production. The battery of 106 Koppers-Becker byproduct coke ovens of the Aliquippa Works of the Jones & Laughlin Steel Corp. will carbonize approximately 2500 tons of coal a day. More than $12,000,000 were spent in the construction of the new ovens which, added to existing batteries of ovens, give the Aliquippa Works a total capacity of 145,000 tons of blast furnace coke per month.

The new battery, built by the Koppers Co., is made up of Koppers patented Becker-type underjet combination coke ovens of a low differential type, incorporating arrangements for automatic internal hot waste gas recirculation. In addition to coke production the new ovens will yield many byproducts, including fuel for boilers, gas, benzol products, tar, ammonium sulphate for fertilizer, pyridine, and other chemicals.

Completion of the new ovens marks another forward step in the $107,000,000 expansion and improvement program underway throughout the Jones & Laughlin Steel Corp.

## Mine Inspectors' Institute Tours Army Supply Depot

One of the interesting features of the Mine Inspectors' Institute held at Columbus, Ohio, June 7-9, 1948, was a visit to the Columbus General Distribution Depot, U. S. Army. Some 350 delegates and visitors enjoyed the exceptional opportunity to view one of the largest Army supply installations of its kind in the world. Arrangements were made for this interesting visit through the courtesy of Brigadier General Frank O. Bowman, Commanding General of the Depot, and Stephen Williams, chief, Division of Mines, State of Ohio, and C. Russell Thompson, legal counsel for the Ohio Coal Association and others of the convention committee.



Coke oven battery of Aliquippa Works. Part of Jones & Laughlin Steel Corp.'s expansion program

## Coal Mine Conducts School Program

In a progressive step to encourage higher education, the Princess Elkhorn Coal Co., in David, Ky., is conducting a school program for its miner employes and their deserving children. The high-school sons and daughters of all miners of the company are eligible to apply for aid in their education. Applications are carefully checked by company representatives, school principals, and teachers. Two fortunate boys, selected from the applicants, will be sent by the company to the University of Kentucky on a four-year scholarship and two girls will be sent to Pikeville College for two years. Other available scholarship permits the recipient to attend any college in the immediate area of his own selection.

David L. Francis, president of the company, sums up the objectives of this program by saying "Our hope is that the students who have thus benefited from such education will take a more active part in, and become leaders of, the local religious, business, and community life."

## Veterans in Mining

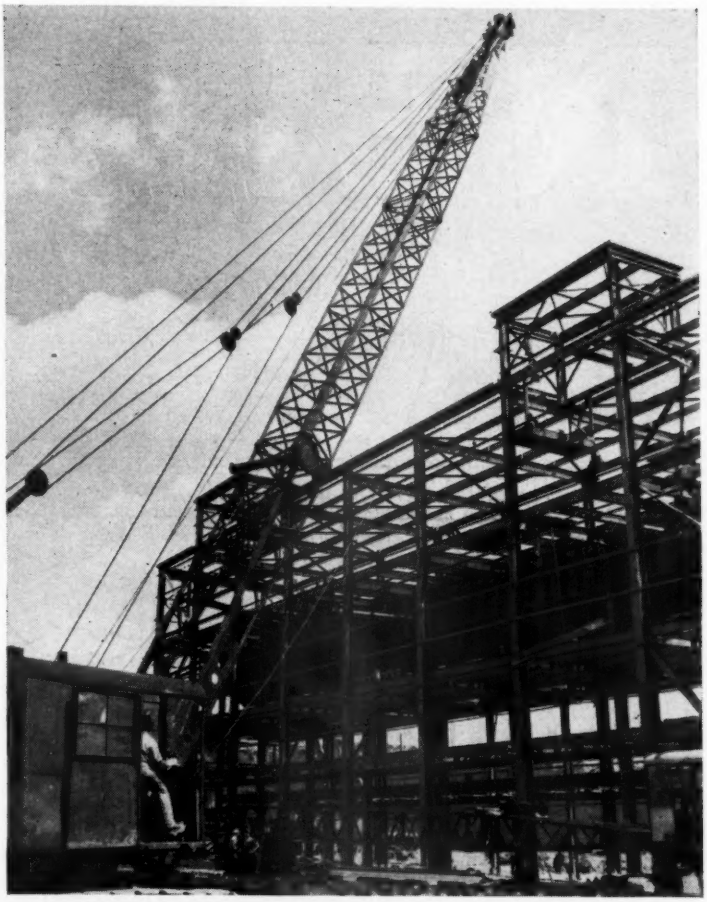
More than 2000 World War II veterans are reported to be training under the G. I. Bill of Rights in mining engineering and for positions in the coal industry. A Veterans Administration survey revealed that 1943 ex-servicemen are in colleges and universities studying mining engineering, and 83 veterans are training on-the-job for occupations in coal mining.

## First Aid Squads Compete for Honors

In the interest of promoting mine safety and trained first aid teams, 18 first aid squads from ten anthracite companies competed for honors in the Fourth Annual Safety Day and First Aid Meet on August 7, at Lakewood Park, near Mahaony City, Pa.

Sponsored by 35 coal companies and arranged by the Middle and Southern Anthracite Operators First Aid Meet Association, the event was jointly promoted by the Pennsylvania Department of Mines (Anthracite Division) and the United Mine Workers of America, with the cooperation of the U. S. Bureau of Mines.

Winner in competing for the cash prizes was the team from the Repplier Coal Co. which won first prize. Teams from the following coal companies also competed: Indianhead, Joliett, M. & S., Haddock Mining (3 teams), Phoenix, Pepplier, St. Clair (2 teams), Hammond (2 teams), Morea-New Boston Breaker Corp., and Locust (4 teams).



Construction work progresses on the world's largest coal washer being built near Brownsville, Pa., for Jones & Laughlin Steel Corp., where metallurgical coal and boiler coal will be separated from impurities by a heavy-media process. Shown here is the raw coal bin structure

Joseph R. Ruane, State Mine Inspector from Shamokin, Chief Judge of the Meet, headed up a group of judges selected from both company and union representatives.

## Promotions at Consolidation Coal Co. (Ky.)

J. C. Ward has been promoted to section foreman in Mine 155. Peter V. Mancini has been promoted to engineer in Mine 214. Also at Mine 214 Luther Varner has been promoted to section foreman as have Warnie Flint and Allard Wright. At the Clover Splint mine Roy Sturgill has been promoted to the position of assistant mine foreman, Henry Shackleford has been made mine foreman, Oscar Jennings has been promoted to dispatcher, and Argie Miller, Theodore Hensley and Harry C. Brown have been promoted to section foremen. Loy Joseph Hammer has been promoted to pit foreman at the strip mine.

## Coal to Japan

More than $6,000,000 worth of coal, largest volume ever shipped from Seattle, Wash., on a single contract, started moving to Japan in July from that port because Japan's coal supply from Manchuria has been cut off by the Chinese Communists. A total of 250,000 long tons of coking coal will move through Seattle's port to Japan during the next five months. The coal will be shipped into the ports of Yokohama and Kobe for the use of Japan's metallurgical industry.

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## BCR Selects Program Director

Gerald von Stroh, of Exton, Pa., has been selected director of the Bituminous Coal Industry's program to develop a continuous mining machine, according to a recent announcement by Dr. Charles E. Lawall, chairman of the Mining Development Committee, Bituminols Coal Research, Inc. Mr. von Stroh is assistant manager of the development engineering division of Lukens Steel Co., Coatesville, Pa. In his new post he will be supported by a full time engineering staff and will be technically assisted by the mining advisory group, striving for the objective of designing a mining machine that will cut coal off the solid without the use of explosives and load the coal onto conveyors or into mine cars in a continuous operation. Temporary offices of the mining development program and the new director will be located at the headquarters office of Bituminous Coal Research, Inc., 912 Oliver Building, Pittsburgh 22, Pa.

## Nine Coal Companies Win Merit Awards for Annual Reports

In a survey of 4000 corporation annual reports, conducted by Weston Smith of *Financial World*, nine coal companies have qualified for "Highest Merit Award" citations:

Ayshire Collieries Corp., M. A. Hanna Co., Lehigh Coal and Navigation Co., Pittsburgh Consolidation Coal Co., Philadelphia and Reading Coal and Iron Co., Pittston Co., Truax-Traer Coal Co., United Electric Coal Cos., West Virginia Coal and Coke Corp.

The 1947 stockholder reports of these companies are candidates for final judging, and one will be selected as the "Best of the Coal Industry" and awarded the bronze "Oscar of Industry" trophy at the Financial World Annual Report Awards Banquet on October 21, 1948. A year ago the 1946 annual report of United Electric Coal Companies won the top award in this industrial classification.

## Mining Scholarship Awarded

Johnstown Coal & Coke Co.'s $2,000 scholarship for Pennsylvania has just been awarded to Robert Bakale, Jr., Portage, Pa. He will attend the University of Pittsburgh for a four-year course in mining engineering. A similar scholarship has been set up for the company's operations in West Virginia.

## Wyco Mine Changes Hands

Operation of the Wyco mine of the Gulf Smokeless Coal Co. in Wyoming County, W. Va., is to be taken over by the Pittston Co. The lease includes the mining operation, producing about 1100 tons of coal daily, and approximately 3000 acres of coal land.

## Portsmouth Steel Purchases Operating Mine

Lewis C. Tierney, president, Tierney Mining Co., Bluefield, W. Va., announced the sale of the Tierney mine and other assets in and around Stone, Ky., to the Portsmouth Steel Co. The mine has a rated capacity of 1500 tons a day, a five-track tipple, an office

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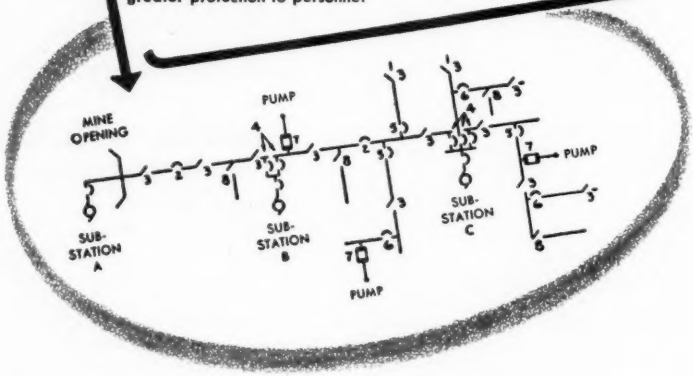


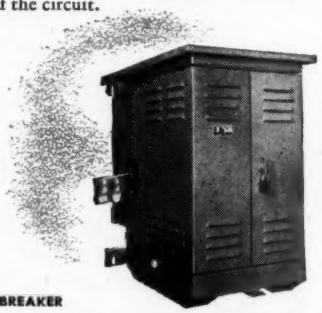

Key

2. I-T-E Type KSC Automatic Reclosing Circuit Breaker installed as overcurrent protective device between each two substations. The KSC protects feeders and equipment by detecting disturbances on either side.
3. A disconnect switch or protective device placed at not over 1500-foot intervals in every power line.
4. I-T-E Type KSA Automatic Reclosing Circuit Breaker used as an overcurrent protective device in each circuit leaving a substation.
5. I-T-E Type KSC used as an overcurrent protective device in each main branch circuit. It is rugged and compact in construction, readily portable, and can be moved as mining progresses and centers of loads change.
6. I-T-E Type KSC used as overcurrent protective device in secondary branch circuits.

Key

7. Circuits to pumps and other fixed loads have overcurrent protection at their supply ends.
8. Unimportant branch circuits such as infrequently used entries, spur tracks, etc., have switches for cutting off all power.

NOTE: In every case, sufficient feeder and return circuit capacity should be provided so that the circuit breaker will be opened by a dead short at the most remote point of the circuit.



*The Heart of Protection . . .* TYPE KSC
AUTOMATIC RECLOSING CIRCUIT BREAKER

The KSC was especially developed for the mining industry. It is completely metal enclosed for safety—yet readily accessible for inspections and maintenance. Overall height: 38⅝".

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building, and store. Included in the sale was an area of undeveloped coal land. The sale did not affect the organization of the Tierney Mining Co., its new Peg Branch mine now under development, or other holdings.

Acquisition of the Tierney mine by the Portsmouth Steel Co. assures the company of coal supply for its steel operations. The mine will continue to be under the operation of George B. Baker, who has been vice-president and general manager for the Tierney company. Arrangements have been made to provide sufficient coal to the Eastern Coal Sales Co. to meet contracts in existence.

## U. S. Delegates Attend Eighteenth International Geological Congress

A group of delegates from the United States attended the International Geological Congress held at London, England, August 25-September 1, 1948. Chairman of the U. S. delegation was Dr. Eliot Blackwelder, Stanford University, and the following delegates attended with him: Dr. Leason H. Adams, director, Geophysical Laboratory, Carnegie Institution; Dr. James Boyd, director, U. S. Bureau of Mines; Dr. Norman Levi Bowen, petrologist, Carnegie Institution; Dr. A. F. Buddington, professor of geology, Princeton University; Dr. Carl O. Dunbar, professor of geology, Yale University; Dr. Herbert E. Hawkes, geologist, U. S. Geological Survey; Dr. W. D. Johnston, Jr., geologist, U. S. Geological Survey; Dr. John F. Marble, chairman, Committee on Geologic Time, National Research Council; and Dr. Louis L. Ray, geologist, U. S. Geological Survey.

## Inland Steel Orders Large Lake Ore Carrier

The biggest fastest bulk cargo ship on the Great Lakes will be built in the Lorain, Ohio, yards of the American Shipbuilding Co., according to a recent announcement. Construction is scheduled to begin at once and the ore carrier should be ready before the opening of the 1950 navigation season. Construction of this vessel, with an estimated cost of around $4,000,000, marks the first new freighter construction for the Great Lakes since 1942.

## Bureau of Mines Loans Gas Turbine for Locomotive Development

Under a cooperative agreement the Bureau of Mines has loaned a large gas turbine once destined for Russia, to the Locomotive Development Committee of Bituminous Coal Research, Inc., for experimentation on the use of pulverized coal as a fuel for gas-turbine locomotives.

## Mining to Require Great Electric Power Increase

Russell S. Sage, manager of General Electric's mining industries division, predicts that future operations in the mining industry will require much greater and more extensive use of electric power than ever before.

Today, one of the largest users of electric power, the mining industry requires some 10 billion kwhr of energy annually, according to Mr. Sage. This represents an increase of roughly 40 per cent in the past ten years.

More power will be required by the bituminous coal industry for the job of expanding production to the point where as much as 65 per cent more coal may be extracted than is now being mined. This expansion can be expected to add 3 to 3½ billion kwhr to our national power load.

Likewise, the mining, concentrating, and smelting of taconite ores to bolster the nation's dwindling supply of direct smelting ores can be expected to require 70 to 80 kwhr per ton as compared with present requirements of 2 to 4 kwhr per ton. This added load may be expected to increase power demand by one-half million or more kilowatts annually.

According to Mr. Sage, the requirements of the mining industry may be expected, in the not distant future, to be double over what they are today.

## Open Pit Operations

(*Continued from page* 36)

road grader, auto-crane, D-8 Caterpillar bulldozers, portable air compressors, welding machines, etc.

Electric power for pit operation comes from a substation erected close to the crusher site. Power is delivered to the substation over two lines, each carrying 6600 v. At the substation it is stepped down to 2300 v and carried directly to the electric shovels. For power for the churn drills, portable transformers are used on the benches, reducing the voltage to 440. Lines from the substation with the required voltages are carried to the crusher, conveyor, tripper, etc.

It is interesting to note that the preliminary studies on this project were started during the latter part of 1946. Active work was actually commenced in March 1947 and by April 1, 1948, production had started. In a period of three or four years valuable data should be available from Inspiration's open-pit operations, especially so in regard to costs and efficiencies. At the present time the pit is operated on day and swing shifts only. The amount of ore being taken from the pit is approximately 150,000 tons per month which may vary depending on existing conditions.


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# A.M.C.

All roads lead to San Francisco this month, when the American Mining Congress convenes. The Houghton Man will be waiting to greet you there, and to show you what's new in these products of the Houghton line:

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**HOUGHTO-SOLV—the fuel oil sludge remover**
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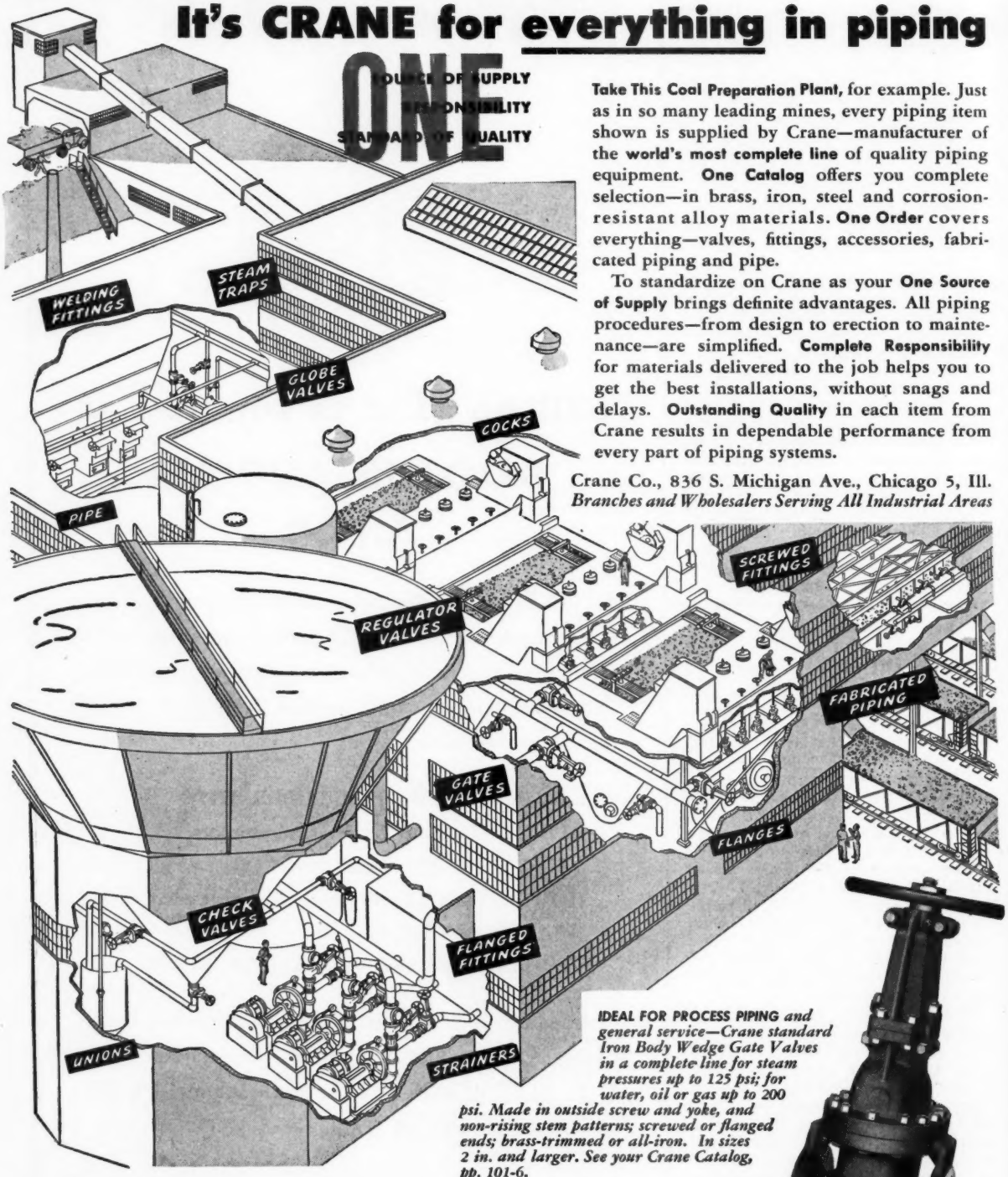
# Above ground...or below
# It's CRANE for everything in piping




**Take This Coal Preparation Plant,** for example. Just as in so many leading mines, every piping item shown is supplied by Crane—manufacturer of the **world's most complete line** of quality piping equipment. **One Catalog** offers you complete selection—in brass, iron, steel and corrosion-resistant alloy materials. **One Order** covers everything—valves, fittings, accessories, fabricated piping and pipe.

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**IDEAL FOR PROCESS PIPING** *and general service—Crane standard Iron Body Wedge Gate Valves in a complete line for steam pressures up to 125 psi; for water, oil or gas up to 200 psi. Made in outside screw and yoke, and non-rising stem patterns; screwed or flanged ends; brass-trimmed or all-iron. In sizes 2 in. and larger. See your Crane Catalog, pp. 101-6.*

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**VALVES • FITTINGS**
**PIPE • PLUMBING**
**AND HEATING**

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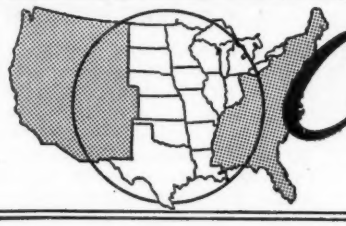
**FOR EVERY PIPING SYSTEM**



# Central States

## Illinois Mining Institute Meeting

The 56th Annual Meeting of the Illinois Mining Institute is scheduled to be held on Friday, November 5, at the Hotel Abraham Lincoln, Springfield, Ill. On the following day the Illinois versus Iowa football game will be seen at Champaign. Those planning to attend this 56th Annual Meeting of the Institute are urged to make the necessary arrangements as early as possible.

## Sinking Begun in Seneca Shaft

The raise being driven from the 33rd level of the Ahmeek No. 4 shaft of the Calumet & Hecla Co. to the bottom of the Seneca No. 2 has been discontinued after reaching a height of 1300 ft. Shaft-sinking operations from the Seneca have been begun to meet the Ahmeek operations and will hole through in about four months.

## Ore Concentration Plant Sold

An ore concentration plant near Platteville, Wis., has been sold to the Calumet & Hecla Consolidated Copper Co. of Calumet, Wis., for $45,500 according to an announcement from the War Assets Administration. During the war years the plant was operated by the United Milling & Mining Co. and was then leased until last August by the Inland Lead & Zinc Co. It was constructed during the war to extract critical zinc and lead from now-exhausted mine tailings.

## Rialto Flood Checked

Water had been rising in the lower ground of the Rialto mine in the heart of the Picher, Okla., field at the rate of 1½ in. per day despite the continued operation of three large pumps. The inflow was thought to be coming from the huge underground reservoir south of the old Admiralty mine in the vicinity of the Quebec and Montreal mines at an estimated rate of 10,000 gpm.

A survey of the situation determined the source of the heavy inflow as coming from a drill hole connecting the Admiralty and Rialto workings with the east center of the Central mill pond. The pond was drained approximately 8 ft below the water level, enough to expose the collar of the drill hole opening, and the hole was plugged with concrete. After plugging, 75 per cent of the inflow was checked in a short time. An estimated 100,000 gallons of water had been drained out of the pond into the Rialto ground.

## Old Mine Being Explored

The Hanna Coal & Ore Corp. is diamond drilling on the old Groveland mine property east of Randville, in Dickinson County, Mich.

About 150,000 tons of iron ore were produced and shipped during 22 years of intermittent operation of the Groveland mine, that finally closed in 1913.

## Bengal Iron Mine Opens New Level

An additional 200 ft have been added to the shaft of the Bengal iron mine at Stambaugh, Mich., on the Menominee iron range. Drifting is now under way to open a new level at that point. Operations are being carried on by the M. A. Hanna Co.

## Coal Utilization Conference

On September 27 and 28 at Urbana, Ill., the 8th annual conference on coal utilization conducted by the University of Illinois, Department of Mining and Metallurgical Engineering will take place. Domestic heating is the theme of the conference which will treat with changing fuel requirements, new developments in heating, customer and employe relationship, and marketing and sales.

## South Agnew Strips Overburden

The operation of the big dragline at the South Agnew mine at Cooley, Minn., is getting underway at a rapid rate. During May 211,310 cu yd of overburden were removed by the 120B shovel and 97,665 cu yd removed by the 1150B. However, during the month of June the big dragline handled nearly twice as much material as the 120B shovel, thereby exceeding expectations during this early period of operation.

## Iron Ore Research

Methods of beneficiation of low-grade iron ores will be tested in the new $200,000 research laboratory which will be erected by Cleveland-Cliffs Iron Co., at Ishpeming, Mich.

## New Tri-State Shaft

A new shaft has been begun on the Buffalo property of the Federal Mining and Smelting Co., southeast of Picher, Okla., according to Ward C. Ball of Baxter Springs, district superintendent of the company. Plans call for sinking the shaft to a depth of 180 ft. On that level, ore blocked out by previous drilling will be mined. A headframe and 400-ton bin are now under construction at the shaft site.

In addition to this operation plans call for rehabilitation of the Trilby shaft on the Granby-American lease and the Granby-Davis shaft at Granby. Stripping operations will be carried on for some time in shallow lead deposits on fee land owned in that area. Recently J. E. Berg, general manager of the Federal Mining and Smelting Co., visited the Tri-State area to make a first hand inspection of the company's holdings.


**SAVE LABOR**

***by moving materials the SAUERMAN WAY***

SLACKLINE IN DEEP PIT

Large savings in man-hours are brought about by using Sauerman Scrapers and Slackline Cableways in strip mining, tramming ore, stockpiling and other jobs where the long operating range of these machines can be employed to advantage.

With one man at the controls, and with a small expenditure of power, a Sauerman machine will dig, haul and dump a large hourly tonnage of any bulk material. Moreover, the cost of the equipment is moderate and upkeep is simple.

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**SAUERMAN BROS., Inc.**

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ALL THESE SAVINGS COME FROM A BETTER GRINDING BALL

Fractured Section Shows extreme hardness and fine martensitic structure extending to the inner core.

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*Grinding Balls*

ALLOY STEEL — FORGED — HEAT TREATED

ADD THEM UP

1. You save on grinding media. Costs are lower per ton of production.
2. Higher average hardness results in longer life.
3. Moly-Cop Balls wear evenly and retain their spherical shape longer than the average ball, resulting in more tons per mill hour.
4. You save on power. You use less power per ton of ore.
5. You save on handling and freight costs. Fewer charges are needed.

Moly-Cop Balls have been proved in actual use in mills of the United States and mining countries all over the world. They have demonstrated that a good grinding ball can effect real cost savings. Specify Moly-Cop Grinding Balls — they're *better.*

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KANSAS CITY, MISSOURI

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## C. & H. Award Scholarship

The Calumet and Hecla Consolidated Copper Co. scholarship in mining or metallurgical engineering at the Michigan College of Mining and Technology has been awarded to D. James Messner. Mr. Messner will enter Michigan Tech in the fall to follow the mining-engineering curriculum. No strings are tied to the scholarship, and Mr. Messner will be free to seek any position he desires upon graduation.

## Mather "B" Shaft Progress

Sinking of the Mather "B" shaft by the Cleveland-Cliffs Iron Co. on the Marquette iron range, Michigan, is progressing at a rapid rate. During the past three months progress has averaged 140 ft of finished steel and concrete lined shaft per month.

## Strike Lead Loss

As of August 10, the Southeast Missouri properties of the St. Joseph Lead Co. were still strike bound. More than 12,000 tons of lead have already been lost because of the strike that began on the night shift of July 7, 1948, and consumers are now feeling the full impact of the shutdown.

## Maumee Collieries Co. Installs Huge Dragline

The Maumee Collieries Co. has just completed installation of a modern excavating unit at its Chieftain mine south of Riley, Ind. The huge 1400-ton dragline, which takes 25 cu yd bites weighing 96,000 lb, is said to be the largest mobile land machine. The 215-ft boom of this dragline extends from a huge steel structure that rests on a circular steel tub 50 ft in diameter. The unit is completely powered by electricity. A feature offering great convenience to the operator is a pressurized cab supplied with dust-free air.

This new walking dragline, constructed by the Bucyrus-Erie Co., is designated as the 1150 B. It digs 120 ft below ground level and dumps about 60 ft above. It can deposit its load 360 ft from the digging point. Moving on its huge 9 ft wide, 54 ft long shoes, the 1150 B "walks" along at 0.11 mph.

All of the coal of the Maumee Collieries Co. is mined by open-pit methods. The company pioneered the use of walking draglines for stripping overburden. Also the company is the oldest one in Indiana which has been continuously engaged in the open-pit recovery of bituminous coal. Manager of the Chieftain No. 20 mine, where the new dragline is located, is E. A. Brinton.

## Wheels of Government

(*Continued from page* 90)

number of men they can put to work and furnish with living quarters.

### Taft-Hartley Rulings

Closed shop demands of the International Typographical Union (AFL) have been held by a trial examiner for the National Labor Relations Board to be in violation of the Taft-Hartley Act. Similar rulings have been made in several cases, none of which have reached the full five-man NLRB for a final decision. The Act outlawed the closed shop by making it illegal for an employer to discriminate against non-union workers in hiring, and also made it illegal for unions to cause an employer to discriminate.

An important precedent has been set by the U. S. circuit court of appeals in Los Angeles through the issuance of an enforcement decree, wherein a plasterers' union has been required to return money exacted by four employes for work they did not perform. The decree also compels the union to post a notice to all members that it will not "cause or attempt to cause an employer to pay or deliver or agree to pay or deliver any money or other thing of value, in the nature of an exaction, for services which are not performed or not to be performed"—this being the language of the anti-featherbedding provision of Section 8(b)(6) of the Taft-Hartley Act.

In a secondary boycott case the NLRB has ordered a distillery union in New York, which brought employes of two distributors of the Distillery Corporation out on strike, to cease such a practice where an objective thereof is to stop any employer or other person from doing business with the distillery. The Board condemned the action of the union as an unfair labor practice and found the union guilty of conducting a secondary boycott.

The above cases are additional evidence of the effectiveness of the Taft-Hartley Act, the operation of which is being closely studied by Senator Joe Ball's (Rep., Minn.) Joint Committee on Labor-Management Relations. Senator Ball now expects to furnish the Committee report to the Congress by March 1, 1949.

### Unfair Labor Practice—UMWA

NLRB hearings to determine the legality of the UMW's union shop contract, discussed in the August JOURNAL, have been completed and final briefs in the case are to be filed by the operators, NLRB Counsel Denham, and the union by September 8. Thereafter the Trial Examiner is expected to expedite his report which,

**Pre-fill Dummies for Greater Safety at the Bore Hole–**

Dummies of Seal-Tite Tamping Bags, pre-filled at one central point, assure the use of permissible stemming materials. A supply of permissible dummies are kept *ready for use* at the face and can be stored underground under the most humid conditions. *Chemically-treated high wet-strength kraft* and plastic-locked safety seam protect them from breaking and spilling.

Dummies of Seal-Tite Bags are always ready for use. Save time—save labor and eliminate hazards at the face through use of proper stemming procedures.

SEND FOR SAMPLES... specify the sizes you need, or a complete assortment.

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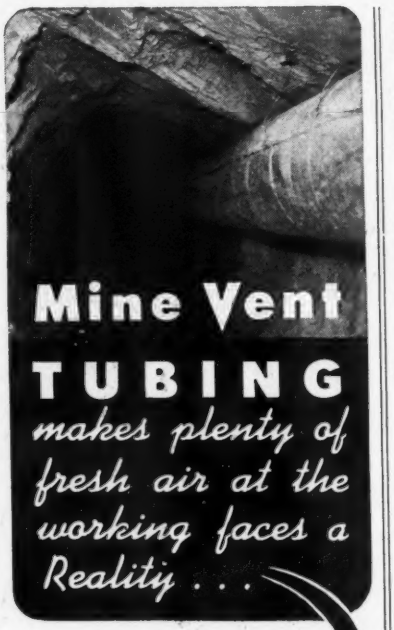


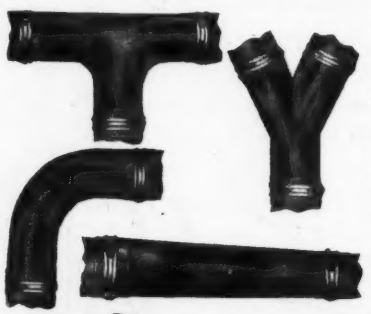
**Mine Vent TUBING** *makes plenty of fresh air at the working faces a Reality . . .*

At a moderate cost, including installation, you can make your ventilation system *complete* with MINEVENT TUBING. The returns in greater output per man will repay the investment many times over.

MINEVENT TUBING delivers fresh air, without waste, to the men who need it. Installation or removal are dead easy with patented couplings and hangers. Standard accessories, shown below,—"Ts", "Ys", "Ls" and reducers—make MINEVENT TUBING adaptable to all conditions. Thus rugged tubing is fungi and leakproofed. It's flexible, withstands repeated handling, and cannot collapse during operation. Three grades: sizes 8" to 36".

ABC JUTE BRATTICE CLOTH is the durable material for sealing off inactive areas and directing fresh air to the men who are working. Properly treated to resist flame, fungi, shrinkage and leakage. Made in two grades.

**Write for ABC samples and full information.**



AMERICAN BRATTICE CLOTH CORP.
WARSAW, INDIANA


after review by the Board, can be taken directly to the Courts.

The hearings were the result of charges brought by 18 steel companies accusing Lewis and the UMWA of insisting upon a union shop clause in violation of the Taft-Hartley Act.

Appearing for the captive coal mine operators, Harry M. Moses stated that Lewis had insisted on the union shop throughout the 1948 contract negotiations and had refused to modify the union shop clause, because he believed that any change in this provision would be taken by the union and the public as an abandonment of the union shop.

UMWA attorneys contended that the charge that an illegal act had been committed in signing the July 13 union shop stipulation was unfounded. They said it was "trivial and without merit" to insist that the miners should vote on the union shop when the miners had clearly demonstrated their support of Lewis' action by striking; that the steel companies signed the July 13 contract "voluntarily" and under the guidance and auspices of Justice Goldsborough, making them equally guilty with the union of any law violation; and that the Taft-Hartley requirement that union officers file non-Communist affidavits is unconstitutional.

## Stotesbury Air Shaft

(*Continued from page* 70)

the gate while moving the cars because of the avalanching of rock after a round of shots had been put off. In many instances the cars had to be kept moving so as not to overrun them. With this method as much as 150 tons of slate per day were handled. Communication between the bottom man and the outside crew was established by dropping telephone lines down the drain hole. In this manner there was little possibility of the bin becoming so full as to stop up the hole

Holes were drilled on 30-in. centers, 5 ft deep and tapering back at the circumference of the shaft to 4 ft. This contributed to easier mucking. All sinkers used safety belts until room was made for the special guard around the 20-in. hole after a round of shots was fired. As soon as an area was mucked, drilling was immediately started following the muckers around the shaft until drilling was again completed. The goal was a round of shots per shift although in some cases two rounds were obtained.

The shaft crew consisted of one general foreman, one shift boss, four muckers and drillers, one hoist operator and one lander, working eight hours, three shifts per day six days per week.

Due to the shaft being unlined it was necessary to scale thoroughly on a swinging scaffold for the protection of employes. Scaling operations usually required three to five eight-hour shifts per week with full crews. The entire work was under the supervision of Glen J. McGuire, superintendent of shaft construction for the Eastern Gas and Fuel Associates.

### Advantages of the Above Method

(1) Shaft sinking 50 per cent quicker than the regular method
(2) Positive ventilation at all times
(3) Drainage positive at all times
(4) Less heavy hoisting equipment on the outside
(5) Simultaneous drilling and mucking proceeds without the interference of hoisting rock
(6) Less labor turnover due to the ease of shaft sinking
(7) Less labor involved in the handling of rock.

## Power for Nevada's Mine

(*Continued from page* 67)

tire northwest corner of Nevada, and little need exists for it. At Gerlach, the Pacific Portland Cement Co. has three 800-hp Diesel units that provide power for its large gypsum mine which is being transferred to the United States Gypsum Co. No electric power is available in the center of the State in the vicinity of Austin and Eureka.

In the present revival of Eureka, the Eureka Corp., backed by Ventures, Ltd., has installed over 4000 kw of Diesel power at a cost of $650,000. A source of low-cost power would greatly facilitate operations in this area.

It is the hope of the Colorado River Commission and the Public Service Commission that these outside sources of electric power will eventually be tied together with a line from Idaho to Elko, with the gap then between Carlin and Battle Mountain closed with a Pacific Gas & Electric and Sierra Pacific line, plus a branch line to Eureka, along with a line from Pioche to Eureka, and a possible line from Gabbs to Austin to Eureka. Such a linking of all sources of supply would equalize power distribution throughout the State and largely eliminate the possibility of a recurrence of crippling power shortages.

# Western States

## Sullivan to Expand Electrolytic Zinc Plant

The Sullivan Mining Co., jointly owned by Bunker Hill and Hecla, announces that it will immediately construct a $750,000 addition to its $3,050,000 electrolytic plant in Government gulch, near Kellogg, Idaho. The plant is now treating 7800 tons of zinc concentrates daily and in addition has been shipping a large tonnage to Anaconda and stockpiling a surplus. The increased supply of zinc concentrates comes largely from new developments in the Pine Creek district adjoining the plant. Until this is completed the company has been compelled to curtail zinc concentrate purchases by one-third. The Sullivan zinc plant turns out a 99.99+ per cent pure manganese product in great demand for die-casting.

## Silver Summit Opens Rich Ore

Rich silver-copper ore has been found in a body of commercial size on the 3000 level of the Polaris-Silver Summit shaft in Idaho where the company has more than 316 ft of ore in 417 ft of drifting on the vein. Assays on picked samples of the ore are unusually high, but conservative sampling shows a mill feed averaging 73 oz in silver and 3 per cent copper per ton. Width of the ore varies from 18 in. up to 11 ft. So far the development has been confined to drift work on the vein, which is still proceeding in rich ore.

## Tennessee Schuylkill Expands

The Tennessee Schuylkill Corp., Chloride, Ariz., has announced its plans for doubling production from its Tennessee mines, following the recent advances in the prices of lead and zinc. The company proposes to launch a new development campaign designed to increase present ore reserves by 350,000 to 400,000 tons. N. A. Wimer is president of the company.

About two months ago the Tennessee Schuylkill Corp. extended its holdings in the Chloride district through the acquisition of a lease and option on the Johnny Bull-Silver Knight group which adjoins the Tennessee on the south. These claims are believed to cover an additional 2000 ft of the Tennessee vein.

The 1000-ft level from the Tennessee is being driven to the south to open the Johnny Bull at depth and the face of the drift is said to be in ore showing a good grade of lead and zinc. Production from Johnny Bull-Silver Knight will be handled through the main Tennessee shaft and sent to the company's 150-ton mill located near the collar of the shaft.

## Anaconda Copper Holds Annual Butte Mines First-Aid Contest

First-aid contests have been almost an annual event with the Butte Mine operations of the Anaconda Copper Mining Co. since 1915. They were suspended during the war years of both World Wars in order that all personnel might devote a maximum of time to actual production.

The First-Aid Contests were resumed in Butte in 1947. In response to a request by the Butte Miners' Union, the Butte Mines contest was held in 1947 and 1948 in connection with the Butte Miners' Union birthday celebration which falls on June 13. This year, the holiday came on Sunday and the celebration was held Monday, June 14.

A total of 84 first-aid men and 16 judges and officials participated in the contest. Five first-aid problems were worked by each team with the following results:

| | Per cent |
|---|---|
| Belmont Mine team, first with a score of | 99.40 |
| Travona Mine team, second with a score of | 98.88 |
| Anselmo Mine team, third with a score of | 98.84 |
| St. Law. Fire Fill, fourth with a score of | 98.68 |
| Mt. View Mine team, fifth with a score of | 98.64 |
| Samplers' Dept. team, sixth with a score of | 98.48 |
| Mt. Con Mine team, seventh with a score of | 98.40 |
| Leonard Mine No. 2 team, eighth with a score of | 98.36 |
| Orphan Girl Mine team, ninth with a score of | 98.28 |
| Leonard Mine No. 1 team, tenth with a score of | 97.96 |
| Tramway Mine team, eleventh with a score of | 97.88 |
| Emma Mine team, twelfth with a score of | 97.68 |

First-aid training and first-aid contests are conducted at the Anaconda operations under the auspices of the United States Bureau of Mines. The Bureau of Mines has trained and certified a large number of first-aid instructors who are employed by the company and who conduct a first-aid training campaign during the winter and spring months. After the contests have been held, a summer vacation is taken and the training is resumed after the close of fishing and hunting seasons.

Butte first-aid teams in action

## Montana Meeting Features Greater Butte Project

BEFORE a capacity crowd of over 300 persons at the annual banquet of the Mining Association of Montana at Virginia City on July 31 on the occasion of the tenth summer convention held in conjunction with the Montana section, AIME, E. S. McGlone, vice-president in charge of western operations of the Anaconda Copper Mining Co., outlined details of the Greater Butte Project. He estimated that the project can confidently be expected to produce 2,600,000,000 lb of copper from above the 3400 level of the mine, "in addition to Butte's copper resources as measured in the light of present mining methods."

"It is also known that large tonnages of ore with similar grade and characteristics exist below the 3400 level but sufficient work has not yet been done to delimit these potential reserves." The Butte Project "has for its object the handling of much larger tonnages than has been possible with present methods," Mr. McGlone said. The Greater Butte Project ushers in the third great period in the history of Butte. During the first period "Butte had produced 6,600,000,000 lb of fine copper," by 1910. "Since that time . . . much has been accomplished in the centralizing of operations and standardization of mining methods and equipment."

This second period in Butte's history saw "another 6,600,000,000 lb of fine copper" produced in addition to 1,000,000,000 lb of electroyltic zinc and in excess of 500,000 tons of manganese oxide nodules. Mr. McGlone pointed out that copper production at Butte was greater during World War II than during World War I, a fact he attributed to the development of a ton of new ore for each ton mined during the intervening years.

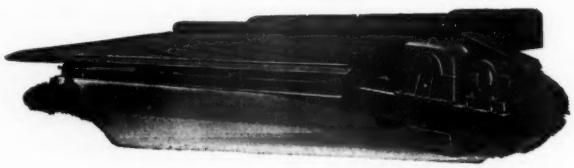
The Greater Butte Project will involve the construction of one of the largest hoisting shafts in the country. Details of the Kelley shaft were published in the June issue of MINING CONGRESS JOURNAL. Other details of the project include the enlarging of the concentrator at Anaconda, Mont., to treat the additional ore provided.

The two-day meeting drew over 400 visitors from six states to the early territorial capital. The first business session featured an address by Kuno Doerr, Jr., of Helena, manager of the A. S. & R. Co. smelter. Speaking of the "Custom Smelter and the Small Mine Operator" he told of the necessity of smelting ferrous and siliceous ores simultaneously, and for stockpiling, since the two types arrive unevenly at the smelter. He pointed out that the custom smelter makes it possible for the small mine to operate since it furnishes an unfailing market.

Dr. Francis A. Thomson, president of the Montana School of Mines, spoke on "Common Sense in Mining." His address was full of wisdom gathered from many years as a mining engineer and educator in the West. Ross D. Leisk, manager of the Sunshine Mining Co. at Kellogg, Idaho, discussed "The Future of Silver." Although he refused the role of prophet he did state "the future of silver looks favorable." Silver is becoming relatively scarcer than gold, and silver coins have been going into hiding in many countries. Silver inventories are low and there is little expectation of the price of silver declining.

On the second day a tour was made of the underground workings of the Easton-Pacific mine, operated by the U. S. Grant Mining Co. Here the men attending the convention were provided the opportunity of watching one of Montana's major mining developments.

At the afternoon session a set of resolutions were adopted that included a vote of thanks to Virginia

*Super Duty* Outmodes
Past Conceptions of Table Performance

Engineers who recollect past patterns of table performance are amazed at the fast handling of feed and the efficiency of SuperDuty Diagonal Deck Concentrating Tables.

These remarkable tables place 75 per cent more working riffles in the direct path of material flow. With the modern Concenco Headmotion, separations are therefore cleaner and can be cut with far greater accuracy than is possible with rectangular tables.

SuperDuty Tables thus produce higher grade products and reduce the quantity of middlings for re-circulation. The lower volume of middlings leaves room for more new feed, with the net result of higher production of finer quality concentrates.

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The Concenco Revolving Feed Distributor is a heavily fabricated, all steel machine, with motor drive requiring only ¾ H.P. in operation. This distributor effectively provides a splitting of feed into any desired number of equal portions. It is especially suitable for feeding efficiently a battery of concentrating tables.

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COMPANY
CONCENCO PRODUCTS

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City, an attack on "bureaucracy, a criticism of high taxes coupled with the demand that government spending be curbed, a condemnation of the federal policy of withdrawing from use and settlement large acres of the public domain, a recommendation for a bonus system to encourage production from high cost property operations, an endorsement of a measure to reimburse operators who incurred expenses during the war effort which they were prevented from later recovering, a recommendation for a free gold market and gold coinage, an endorsement of laws and regulations of the SEC that now recognizes the justice of many changes advocated by various mining groups, a suggestion for a broad and liberal policy in regard to mining loans by the RFC and several other items of local interest to the Northwest."

On adjournment, the delegates witnessed a parade and mock trial and hanging of an early day road agent known as George Ives, and then attended a cocktail party before the final banquet.

## Colorado Coal Development

Nearly $5,500,000 will be spent by the Colorado Fuel & Iron Corp. to develop a coal mine in Las Animas County, Colo., and an additional $600,000 will be expended in corporation-wide improvements. This amount does not include the multi-million dollar rod mill now being constructed at the Minnequa plant. Construction of this mill has already been started.

## Phelps Dodge Purchases RFC Plants

The copper reduction facility at Morenci, Ariz., and the copper refining facility located at El Paso, Texas, built by the RFC during the war at a cost of approximately $28,000,000, have been sold to the Phelps Dodge Corp. The plants have been operated under lease since March 1942 by Phelps Dodge Corp. and its subsidiary, Phelps Dodge Refining Corp.

## Magdalena District Activity

Expanding activity is under way in the Magdalena Mining District, Socorro County, N. M. Principal operators are the American Smelting and Refining Co., with a steady production record from the Graphic-Waldo Mine; MacDonald and Dobson operating the Nitt Mine, adjoining the Graphic-Waldo, and Elayer and Richmond operating the Linchburg Mine under lease from the Empire Zinc Co. The Magdalena District dates back to 1880 and has a production record of $40,000,000 in lead, zinc, copper, silver and gold.


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*Pipe Couplings, Inc., 30 Rockefeller Plaza, New York 20, N. Y.*

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## Revived Interest in Shasta Copper Belt

The sustained demand for copper, lead and zinc has revived interest in the old Shasta Copper Belt near Redding, Calif., and the area is now being mapped and studied. Recorded production from the district is nearly 700,000,000 lb of copper.

The Mountain Copper Co., Ltd., developed sufficient zinc-copper ore in 1943 to justify a 350-ton mill. The Coronado Copper and Zinc Co., a Harvey Mudd interest, purchased the old Afterthought mine at Ingot in 1945. Since then sufficient zinc-copper ore has been developed to justify a flotation plant now under construction.

## Empire Zinc Takes Over Old Property

The Empire Zinc Co. of Hanover, Grant County, N. M., has taken an option on the American Mine at Hachita, N. M., a zinc-lead property, with a $1,000,000 production record during a 10-year period in the 1880's. Owner of the mine is Mrs. Maude J. Fowles of Hachita. The mine will be unwatered preparatory to extensive exploration and development, according to A. L. Hayes, superintendent of the Empire Zinc Co.

## Synthetic Mica Perfected

Synthetic mica is being manufactured at the Colorado School of Mines in Golden, Colo., under government contract, according to a recent announcement by Dr. M. F. Coolbaugh, former president of that institution. Until this announcement, the nature of this work had been kept under strict military wraps. Decision to reveal it was reached recently at a conference at Ft. Monmouth, N. J., attended by Army, Navy, Bureau of Mines, Bureau of Standards, Owens-Corning Fiberglass Corp., which started the original experiment, and Colorado Mines officials.

Actual production of the material at the school is just one part of the project in which these various agencies are joined. The work was started at Golden by Dr. Leon Ward, head of the Mines chemistry department. It is now in the charge of Dr. Coolbaugh with Dr. W. C. Aitkenhead as research associate and H. B. Corbin as control analyst. Actual work was started in April of last year.

Desiring to develop a synthetic mica that is not merely a substitute, but a product superior to the natural mineral, and in order to relieve the United States from its dependence of foreign produced mica, the War Department signed a contract with the school in 1946. The high chemical purity, special-purpose natural mica has many uses in military electronic devices of strategic importance.

In the actual manufacturing process, the raw materials, finely crushed feldspar and carefully measured quantities of magnesium oxide and magnesium fluoride, are mixed and melted in a special furnace to temperatures up to 2700 F and allowed to cool slowly. Mica crystals form as the melt cools. So far, crystals thus produced have been small, but large size is not the primary aim of the work. Small sheets, 2 in. square, are ample in size. Purity of material and absence of all water are vital in obtaining a material of the required dielectric strength. Immediate problems under investigation include suitable containers to hold the melt and means of cooling it to achieve maximum size of crystal.

## Jardine Mine Operations Cease

All mine and mill operations at Jardine in southern Park County, Mont., have been temporarily suspended, Gailen Vandel, general manager of Jardine Mining Co., recently announced. The shutdown throws approximately 90 men out of work, but most of these have accepted work in other sections.

Loss of the company's cyanide plant by fire last May and high shipping costs of concentrates containing a high arsenic content that the smelters in the Montana area are unable to handle were given as reasons for the decision to close down. After the cyanide plant was destroyed, the Jardine company shipped concentrates to East Helena smelter, but the opening up of new orebodies containing a higher arsenic content than previous deposits and the necessity of shipping concentrates had increased operating costs to a prohibitive level.

The general manager said operations will be resumed next year provided the cyanide plant can be rebuilt by then. Lateness of the season and inability to obtain steel and other building materials has delayed reconstruction plans until next spring.

## Miners' Homes Planned

Two new residential construction projects have been announced by the Phelps Dodge Corp. The first will consist of 50 houses to be erected near Bisbee, Ariz., at the Galena Townsite, to provide accommodations for miners employed underground at the Copper Queen mines. The second calls for the construction of 45 new housing units in the Plantsite area, midway between Morenci and Clifton. These new units will relieve the housing shortage caused by increased personnel at the Morenci Branch.

## Kaibab Mines Produce High-Grade Copper Ore

Thirty tons of copper ore are being mined daily at the Kaibab Mines near Jacobs Lake in the Kaibab Forest of Arizona. Copper values at the Kaibab, an open-pit operation, are said to average 6 per cent and occur as carbonates and oxides in lime, with 7-ft sandstone overburden. The mineralized zone is approximately 20 ft wide and has been mined for 700 ft. Equipment includes a ¾-yd Diesel electric shovel, wagon drills and 5-ton trucks. Six men are employed in the work by Atherley Brothers of Fredonia, Ariz.

## Two Companies Attack Housing Problem

Sunshine and Bunker Hill Mining Companies are pioneering a home-building program designed to solve the housing shortage for employes and increase the labor supply needed in the mining industry. Each company is spending an initial investment of $250,000 in constructing new and modern homes for mine employes. Each home is of different design in an effort to avoid the "company" appearance. The idea has also spread to the Metaline district in Washington, where the Pend Oreille Mines & Metals Co. is converting a huge hotel development into a five-story apartment home for miners with 58 apartments equipped with electric ranges and refrigerators and heated by steam. In addition, the company is spending $125,000 on new dwelling houses.

## The "New Look" in Prospecting

Bulldozers and jeeps have replaced the old prospector in the Coeur d'Alene district. The Hecla and Sunshine Mining Companies have demonstrated that a mineral territory can be prospected with a bulldozer in one summer season that would take the old-time prospector a life-time to accomplish. Geologist and mining engineers follow up the bulldozers in jeeps.

## Drilling Tests Near San Manuel

The San Pedro Mining Co., John W. Daily, president, Box 2086, Tucson, Ariz., is planning to drill two new test holes during May. The new holes are to be drilled about 800 ft deeper than previous ones in order to determine the suphide zone and its values. The San Pedro property is located between Tiger and Mammoth, Ariz., near the San Manuel deposit now under development by Magma Copper Co.

## California Dredge

To supply power to the bucket-line dredge now being assembled on the Klamath River about a mile above Happy Camp, Calif., by the Reeves Ranch Dredging Co., a 6½-mile power line is now being built. This new dredge will have 68 buckets of 4 cu ft capacity and will be capable of digging to a depth of 23 ft. About 3000 cu yds of gravel will be handled in 24 hours.

## Safety Methods

In response to inquiries as to how the Union Pacific Coal Co., Rock Springs, Wyo., achieved its unusual safety record, I. N. Bayless, president of the company, said, "It's all a matter of organization and training mixed with perseverance and hard work."

Courses in first aid are conducted every six months and new employes are required to attend classes every night until they are able to pass an examination. Students having difficulty are given special training until capable of passing the tests. The courses are conducted under the supervision of the Bureau of Mines which furnished the original instructor to school company first-aid trainers.

A system of prize drawings, conducted both on a monthly and annual basis, is an added incentive for the miners to exert every effort to avoid lost-time accidents. Monthly meetings and prize drawings are held for all eligible miners. Under conditions featuring relaxation and high good humor, safety problems are discussed at these gatherings. Semi-annual meetings are also held along similar lines as a further inducement to avoid lost-time accidents.

School books, safety inspections, and safety bulletin boards contribute their part to the overall safety program of the company. Each mine is organized into safety sections under the direction of a supervisor of safety. A book of standards is available to guide workmen in the installation of wiring, tracks, machinery and equipment. In addition each employe has been furnished a book of safety rules to observe.

Unusual steps have been taken to promote some safety measures. Free eye examinations have been given and miners were supplied with free goggles corrected to their vision.

A Greek Letter Safety Society was formed in 1941 for supervisors and every effort is made among all employes to promote safe practices and careful observance to safety rules.

The safety program of the Union Pacific Coal Co. has paid off in averting a great deal of human misery and unhappiness and has resulted in substantial savings and costs in production.


Get
Greater Safety
plus "the Low Cost of Lifting"
with
SIMPLEX
Mine Jacks

No. 85A Simplex Ratchet Jack Raises Cutter Bar

Choose Simplex Mine Jacks for Safety First in all types of mine jacking. In addition you get easier operation, longer jack life and efficiency to lower your cost of lifting.

Check these important Simplex features: Drop forged, alloy steel heat treated parts — Precision machining — Expansion rivets instead of machine screws — Unbreakable trunions — No fulcrum pins — Maximum strength with minimum weight.

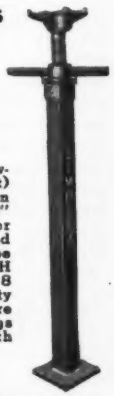
Specify Simplex—get the benefit of the superiority which resulted in these jacks being awarded the *only* gold medal for the safety of jacks by the American Museum of Safety.

**GENERAL PURPOSE MINE JACKS**

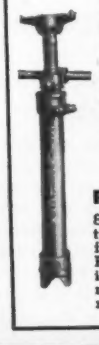
**Single Acting — Ratchet Lowering**

A Jack for every heavy duty mine job—5-to-35 tons capacity. All lift full capacity on cap or on the toe of Jack, a feature exclusive with Simplex!

**Adjustable MINE ROOF JACKS**
**M8, M9, M16 and M17**
**3 Types of Heads**



Type "FS" Flat Swivel (on Jack at right) for use with wooden pieces. Type "C" (above left) for square and round timbers, and Type "FF" for small H beams and rails. 8 and 16-ton capacity models with square tubing or fittings only for use with round pipe.



**Simplex PIN-UP JACKS**

8 and 16-ton capacities with new type "FL" head—flat with lugs—for square tubing and round pipe. Eliminates the danger of knocking out posts. Enables loading machines to load out full cut. Unnecessary to re-set jack.

**WRITE FOR BULLETIN MINES 47**

Get this fully illustrated bulletin with detailed information on all Simplex Mine Jacks. In addition to those shown here these include: Post Pullers, Timber Jacks, Electrided Track Jacks, Journal Jacks, Anchor Jacks, Wire Tensioning Jacks, and the Simplex-Jenny Center Hole Hydraulic Puller.

**GEARED JACKS** 25 and 35-ton capacities. For heavy duty work such as rerailing mine or railroad cars. Built for power, speed, ruggedness.

**HYDRAULIC JACKS** 3 to 100-ton capacities. Safety tested to 50% over capacity. Easy to operate, vertically or in horisontal position.

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Jacks

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# Manufacturers Forum

## New Washing Plant Scheduled for 1949 Completion

A contract has been awarded to the Roberts and Schaefer Co. by the Blue Diamond Coal Co. of Knoxville, Tenn., for the construction of a coal washery to clean R.O.M. coal at 700 tons per hour, of which 600 tons are mechanically cleaned. The plant will be located at Leatherwood, Ky. The washing unit will be Jeffrey Baum jig, with Bird dryers and water clarification, a flash drying system for heat drying of the fine coal, a refuse disposal system, and 700 ft of bridge spanning the valley for a common tram road to serve the entire acreage.

## Underground Insulated Wires

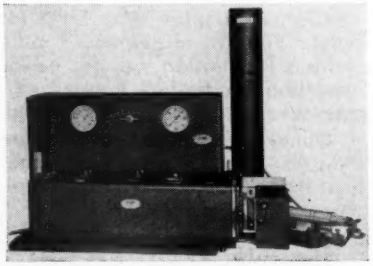
A new electrical wire with a rubber insulation said to improve when soaked in water has been developed by United States Rubber Co. especially for use underground in wet locations. A coating of high purity natural rubber latex applied by the dip process is said to be the secret of the wire's durability. Tests conducted by Underwriters' Laboratories, Inc., where the wire was immersed in water at a temperature of 122 F for 24 weeks, showed the insulation resistance curve to rise from 500 megohms to 2400 megohms per 1000 ft of wire. Normal insulation resistance curves show a sharp drop after two to four weeks immersion. The new wire is being marketed under the trade name "Laytex RUW."

## Powered Boom Jumbo

The new Ingersoll-Rand air-powered drill jumbo features air-powered booms which can be raised or lowered with no manual effort. It was designed for high-speed drifting, crosscutting and tunnel driving and is capable of working in an opening with a height up to 9 ft and with a width varying between 5 and 14 ft. Air motors raise or lower the booms which may be locked into position during the drilling operation. Three screw-driven adjustable-length ceiling jacks serve to hold the jumbo in place during drilling and may be folded back onto supports when the jumbo is to be moved. Likewise the booms may be swung back and lowered onto supports on the car to make the jumbo into a small, compact, easily moved unit.

## Flame Spectrophotometer for Ore Analysis

The National Technical Laboratories have recently announced the



availability of a Beckman Flame Spectrophotometer said to greatly simplify both qualitative and quantitative analyses of a large number of chemical elements. The hot flame is said to be of particular value since it permits excitation of the spectral lines of a large number of elements, including many of the heavy metals and alkaline earths. It is adaptable to a variety of analytical problems including water analyses, metal and ore analyses. High accuracy is claimed for this new unit.

## Inclined Belt Conveyor

Travelling two-thirds of its route over a suspension bridge inclined at a 19-deg angle, a belt conveyor designed and built by Goodyear Tire & Rubber Co. carries refuse from a central coal cleaning plant in a valley to a spoil pile over a hill 1500 ft away for the United States Coal & Coke Co. The specially-designed belt will carry 350 tons of material hourly, discharging 486 ft above the loading point. The belt's speed is 400 fpm.

Suspension bridge supports Goodyear steel cable belt hauling refuse from cleaning plant of U. S. Coal & Coke Co., Gary, W. Va.

## Plate-Type Fasteners for Heavy Conveyor Belts

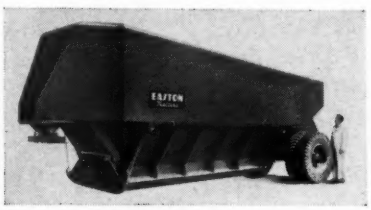
Armstrong-Bray and Co., Chicago, have announced a new line of fasteners and repair plates for heavy-duty conveyor belts. The new Plategrip belt fasteners are designed for application anywhere and in such a manner as to pull belt ends together into a smooth, flexible tight joint. These fasteners are made for belts from ¼ to 1½ in. thickness.

## Mine Timber Jack

An improved model of the Simplex Mine Timber Jack with a double acting mechanism to lift or lower on both the up and down stroke is now available through the Templeton-Kenley Co., Chicago. The complete devise weighs 57 lb. Designed to reduce timbering costs, the unit is said to easily and safely lift heavy timbers, structural beams or rail sections.

## Heavy-Duty, Bottom-Dump Trailer

A bottom-dump trailer designed to hold 32-ton loads of bituminous coal in strip mining operations has been added to the line of heavy-duty, off-



highway trailers built by Easton Car & Construction Co., Easton, Pa. The units feature an air-powered radial gate operated either from the cab of the tractor or from the rear of the trailer.

## New Manganese Steel Slushing Scraper

The Amsco-Whisler Scraper illustrated, which offers a new design for the moving of greater tonnages, is announced by the American Manganese Steel Division of American Brake Shoe Company, Chicago Heights, Ill.

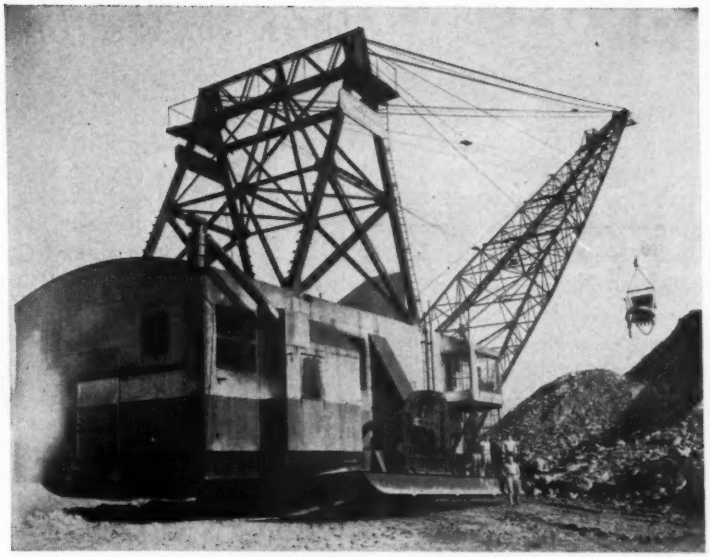
The design of this all-manganese steel scraper gives one-piece rigidity by means of dovetailed castings that interlock and bind the whole assembly into a solid unit. There is no stress on the assembly bolts, which are recessed for protection against impact.

Flexibility in operation is obtained through easy assembly and disassembly of the main castings underground for moving through tight spots or for eventual repairs.

This scraper is designed to get out large tonnage through the attachment of arms to body ends for wider spacing, which allows pay-load build up of ore and easy nestling over large boulders.

For maximum service life the unit is built throughout of austenitic manganese steel, "the toughest steel known" which will not fracture under severe impact and which work-hardens on the surface to as high as 550 Brinell to resist abrasive wear.

Amsco-Whisler Scrapers can be made in widths of 72 in., 66 in., 60 in., 54 in., 48 in., 42 in., 36 in., and 30 in.; either without side plates or with half or full box side plates.



Wire rope on the Bucyrus Monighan 9-W, 8-cu-yd dragline of the Penbrook Contracting Co. at their stripping operation near Ashland, Pa., has given excellent service. Records kept over an 18-month period showed that Jones & Laughlin precision-built wire rope gave an average service life of 805 hours. One line lasted more than 1425 working hours while this machine was engaged in one of the toughest rope-eating jobs in strip mining—the removal of blasted rock overburden

## Man Against Rock

A 16-mm color film with sound, featuring heavy rock excavation, has been prepared by Gardner-Denver Co. Purely educational in nature, this film carries no advertising throughout its 33-minute run. Prints are available for showing to schools, engineering societies and other interested organizations.

Rock drilling, blasting, mucking and other phases of construction work are portrayed in the film that covers four interesting construction projects.

## —*Announcements*—

**M. B. Garber,** assistant sales manager and export manager of the **Thew Shovel Co.,** Lorain, Ohio, has been appointed general sales manager, succeeding Don G. Savage who died in July. **Q. J. Winsor** and **J. T. Cushing** have been appointed assistant general sales managers.

* * *

**Lawrence W. Early,** resident manager of the Los Angeles office of **Hercules Powder Company** explosives department, has been transferred to the company's Salt Lake City office. **Robert W. Crabtree** will succeed Mr. Early as resident manager of the Los Angeles office.

* * *

**J. R. Fulton** is the new manager of the Mining Section of the **Westinghouse Industrial Sales Department.**

**Arthur B. Palmer** has been appointed general manager of the **Sperry-Sun Well Surveying Co.** according to an announcement by Samuel H. Williston, vice-president and director.

* * *

**George H. Deike, Jr.,** has been appointed secretary and **C. P. Rooney** assistant treasurer of the **Mine Safety Appliances Co.**

* * *

**John E. N. Hume,** commercial vice-president, **General Electric Co.,** has retired from the company after 41 years of service.

* * *

**Robert J. Russell** has been named secretary of the **Hardinge Co., Inc.,** as well as chief of the technical staff.

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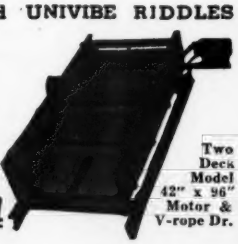

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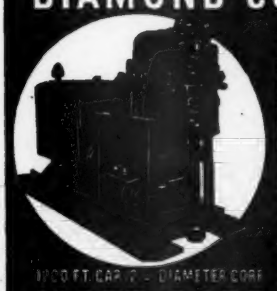

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